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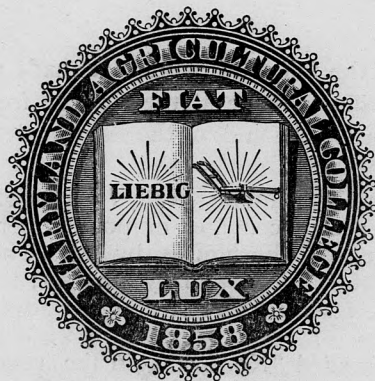
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ADDRESS

Chemical Department, Maryland Agricultural College,
COLLEGE PARK, MD.

ANALYSIS OF COMMERCIAL FERTILIZERS SOLD IN MARYLAND

BY THE CHEMICAL DEPARTMENT OF THE
MARYLAND AGRICULTURAL COLLEGE.

DR. H. B. McDONNELL, *State Chemist.*
J. R. LAUGHLIN, B. S., *Assistant Chemist.*
M. N. STRAUGHN, B. S., *Assistant Chemist.*
J. B. ROBB, B. S., *Assistant Chemist.*
T. R. GOUGH, B. S., *Assistant Chemist.*

The tables on the following pages are made up of the results of the analysis of fertilizers made at the College from August, 1899, to January, 1900, inclusive, the most of the samples were collected during September and October.

The figures in the columns headed "Ammonia," "Potash" and "Phosphate Acid" are percentages or pounds per hundred. To get pounds per ton multiply the figures by 20. The columns headed "Found" contain the results found by analysis; those headed "Guaranteed" contain the essential part of the guarantee as stamped on the bags.

The columns headed "No." contain the respective numbers by which the samples are known in the laboratory, and will be found on all the records and reports. In writing to the Chemical Department in regard to analysis the number should always be given. The samples are numbered consecutively on the books of the office, but are arranged alphabetically for publication, which accounts for the mixing up of the numbers.

The "comparative value found" and the "comparative value guaranteed" are calculated, the former from the analysis found, the latter from the analysis guaranteed on the bags, using the following schedule.

In Mixed Fertilizer:		15 cts. per pound.
For Nitrogen, calculated as Ammonia.....	6 "	" "
" Potash (K_2O), in forms free from muriate.....	5 "	" "
" Potash (K_2O), as muriate.....	5 "	" "
" Available Phosphoric Acid.....	2 "	" "
" Insoluble Phosphoric Acid.....	1 "	" "
" " " " when from S. C. Rock.....	4 "	" "
In Dissolved S. C. Rock:		
Available Phosphoric Acid.....	4 "	" "

In Ground Bone:

For Nitrogen, calculated as Ammonia, in "Fine" Bone.....	14	cts.	per pound.
" Nitrogen, calculated as Ammonia, in "Fine Medium" Bone.....	12	"	" "
" Nitrogen, calculated as Ammonia, in "Medium" Bone.....	10	"	" "
" Nitrogen, calculated as Ammonia, in "Coarse" Bone.....	8	"	" "
" Phosphoric Acid in "Fine" Bone.....	5	"	" "
" " " " "Fine Medium" Bone.....	4	"	" "
" " " " "Medium" "	3	"	" "
" " " " "Coarse" "	2	"	" "

In Tankage and Ground Fish:

For Nitrogen, calculated as Ammonia.....	12	"	" "
" Phosphoric Acid.....	3	"	" "

In using the above schedule *all fertilizers containing less than 1 per cent. of ammonia will be given the rock valuation of 4 cents per pound on the available phosphoric acid.*

The "comparative values" given in the table are not claimed to be the proper prices to be paid for the various fertilizers at the place of sale or use; this varies considerably, depending on the market prices of the ingredients, freight, commissions, size of order, cash or credit, &c.

Ground bones are put in a separate table, following the table of other fertilizers. Both the chemical and mechanical analysis is given. The mechanical analysis shows the fineness of the bone, and is determined by sifting through a series of sieves with circular perforations (instead of the usual wire) as follows:

Bone passing through 1-50 inch is "Fine."

Between 1-50 and 1-25 inch is "Fine-Medium."

Between 1-25 and 1-12 inch is "Medium."

All which will not pass the 1-12 inch is "Coarse."

Each grade is given its own valuation on both phosphoric acid and ammonia; the chemical composition of each grade being assumed to be uniform.

Guarantees should be as simple as possible. In Dissolved S. C. Rock (phosphate rock from other States is also used for making phosphate) or acid phosphate, all that is needed is the available phos. acid, which should not be less than 14 per cent.

In mixtures of Acid Phosphate and Kainit or other Potash Salt, the per cent. of Potash should be added, making the essential guaranteed analysis as follows:

Available phosphoric acid.....
Potash.....

In complete fertilizers the ammonia or nitrogen is added, giving:

Available phosphoric acid.....
Potash.....
Ammonia.....

Insoluble Phos. Acid may be added. The "Total" is simply the sum of the available and insoluble. (The "available" is the sum of the "soluble" and "reverted" phos. acid.)

The guaranteed analysis of ground bone should mention only the total phos. acid and ammonia (or nitrogen).

"Bone Phosphate" is simply the phos. acid multiplied by 2 1-5 and given over again in that form.

It is unlawful to print a maximum guarantee on fertilizers in Maryland. The fine for doing so is \$100 for the first offense.

For Table of Fertilizer Analysis See Page 16.

TABLE 1.

Percentage Composition of Commercial Fertilizing Materials.—(Beal.)

*Analyses Thus Marked Have Been Supplied by the Editor.

NAME.	Moisture.	PHOSPHORIC ACID.		Potash.	Nitrogen.	Ammonia. (Nitrogen $\times \frac{17}{14}$)	Lime.
		Available.	Total.				
Ammonite.....	5.88	.....	3.43	.79	11.33	13.76	 †
Apatite.....	.....	.....	36.08	.....	.....	.....	44.
Ashes, anthracite coal....	.....	.....	.10	.10	.....	.....	.....
“ bituminous.....	.....	.....	.40	.40	.....	.....	.....
“ lime kiln.....	15.45	.....	1.14	1.20	.....	.....	48.50
“ wood, leached....	30.22	.....	1.51	1.27	.....	.....	28.08
“ “ unleached	12.50	.....	1.70	5.25	.....	.....	34.00
Bat Guano.....	40.09	3.61	3.80	1.31	8.20	9.96	.....
Bone Ash.....	7.00	.....	35.89	.....	.....	.....	44.89 †
*Bone Black.....	14.00	.....	33.61	.....	.....	.....	40.00
* “ “ dissolved....	.....	17.56	18.32	.....	.....	.....	..... †
*Bone Meal.....	.....	.....	24.17	.....	4.25	5.16	29.
* “ “ steamed.....	.....	.....	26.65	.....	2.11	2.56	32. †
* “ “ dissolved....	.....	12.16	16.73	.....	2.21	2.68	20.
* “ “ from glue fac- tory.	.....	.....	29.90	.....	1.70	2.07	.....
*Carribean Guano.....	10.15	.....	27.20	.....	.....	.....	.....
Castor Pomace.....	9.50	.....	1.75	1.10	5.50	6.62	.....

†Estimated.

NAME.	Moisture.	PHOSPHORIC ACID.		Potash.	Nitrogen.	Ammonia. (Nitrogen $\times \frac{17}{14}$)	Lime.
		Available.	Total.				
Cotton Hull Ashes.....	7.80	7.75	8.85	22.75	.....	.....	9.60
Cotton Seed Meal, hulled	7.75	.....	2.88	1.77	6.79	8.27	.....
“ “ “ unhulled	.....	.....	3.10	1.50	4.30	5.22	.....
*Dried Blood.....	11.85	.....	1.74	.....	11.27	13.68	.....
*Dried Fish.....	.....	.....	7.97	.....	7.69	9.34	.....
*Eel Grass (zostera marina)	81.19	.....	.07	.32	.85	.43	.51
*Gas Lime, fresh.....	19.19	.....	.22	.....	.....	.....	42.44
* “ “ average of 5..	28.11	.....	.15	.....	.....	.....	37.64
Horn and Hoof Waste.....	10.17	.....	1.83	.....	13.25	16.09	.....
*Kainit.....	20.02	.....	.....	12.55	.....	.....	.....
Kelp (laminaria).....	87.75	.....	.06	.24	.20	.24	.40
Lobster Shells.....	7.27	.....	3.52	.....	4.50	5.46	22.24
Marls, Kentucky.....	1.50	.....	.2	.1-3	.....	.....	3-34
“ Md. and Va.....	1.50	.....	.0-2	.2-5	.....	.....	0-40
“ N. J. Green Sand..	1.50	.....	.1-4	3 5-7	.....	.....	1-9
“ North Carolina...	1.50	.....	0-4	.2-1.5	.....	.....	5-45
Meat Scrap.....	12.09	.....	2.07	.....	10.44	12.68	.....
Mona Island Guano.....	13.32	7.55	21.88	.....	.76	.92	37.49
Muck.....	50.00	.....	.10	.15	1.10	1.34	.....
Mud, Salt.....	60.00	.....	.10	.35	.40	.49	.90
*Muriate of Potash.....	2.21	.....	.....	55.17	.....	.....	.....
Navassa Phosphate..	7.60	.....	34.27	.....	.....	.....	37.45
*Nitrate of Soda.....	1.65	.....	.....	.....	15.80	19.18	.....

NAME.	Moisture.	PHOSPHORIC ACID.		Potash.	Nitrogen.	Ammonia. (Nitrogen $\times \frac{17}{14}$)	Lime.
		Available.	Total.				
*Oyster Shell Lime			.20				84.58
*Peat.....	57.60					.39	.....
Peruvian Guano....	14.81	7.30	15.30	2.65	7.35	8.93	.....
*Plaster, Pure.....							32.56
Soot.....	5.54			1.83			+
*S. Carolina Rock, dis- solved	14.17	14.45	15.87				24.
*S. Carolina Rock, Ground			27.85				+
Spent Tan-Bark Ashes ..	3.61		1.61	2.04			33.64
Sumac Waste.....	63.06			3.25	1.19	1.45	1.14
Sulfate of Ammonia.....	1.00				20.50	24.89	.....
Sulfate of Potash and Magnesia.	4.75			25.50			2.57
*Sulfate of Potash, High- Grade.	1.97			50.09			.....
Sylvanite.....	7.25			16.65			.....
Tankage.....	10.00	5.40	11.80		6.70	8.14	.....
*Thomas Slag.....			16.25				.....
Tobacco Stalks.....	6.18			.65	5.02	3.71	4.50
Tobacco Stems.....	10.00			.70	8.20	2.35	2.85
Wool Washing.....					3.92		.....
Wool Waste.....	15.80			.35	1.20	6.50	7.89
							.11

Composition of Farm Manures.

Barn Yard Manure, Aver- age.	68.87		.32	.43	.49	.60	
Cattle Excrement, solid, fresh.			.17	.10	.29	.35	

COMPOSITION OF FARM MANURES.

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NAME.	Moisture.	PHOSPHORIC ACID.		Potash.	Nitrogen.	Ammonia. (Nitrogen $\times \frac{17}{14}$)	Lime.
		Available.	Total.				
Cattle Urine, fresh.....	.....	.....	.....	.49	.58	.70	.....
en Manure, fresh.....	60.00	.....	.85	.56	1.10	1.34	.....
Horse Excrement, solid.....	.....	.....	.17	.35	.44	.53	.....
Horse Urine, fresh.....	.....	.....	.....	1.50	1.55	1.89	.....
Human Excrement, solid.....	77.20	.....	1.09	.25	1.00	1.21	.....
Human Urine... ..	95.00	.....	.17	.20	.60	.73	.....
Pigeon Manure, dry.....	10.00	.....	1.90	1.00	3.20	3.89	2.10
Poudrette, night soil.....	50.00	.....	1.40	.30	.80	.97	.80
Sheep Excrement, solid, fresh.....	.....	.....	.31	.15	.55	.67	.....
Sheep Urine, fresh.....	.....	.....	.01	2.26	1.95	2.37	.....
Stable Manure, mixed... ..	73.27	.....	.30	.60	.50	.61	.....
Swine Excrement, solid, fresh.....	.....	.....	.41	.13	.60	.73	.....
Swine Urine, fresh.....	.....	.....	.07	.83	.43	.52	.....

Table II.

Fertilizing Constituents of Feeding Stuffs and Farm Products.

(Year-Book U. S. Dept. of Agriculture.)

MATERIAL.	Phosphoric Acid.	Potash.	Nitrogen.	Nitrogen Equivalent to Ammonia.	Ash.	Water.	Comparative Value of Fertilizing Ingredients.
GREEN FODDERS.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	
Pasture Grass.....	.23	.75	.91	1.10	3.27	3.1	\$4.28
Green Fodder Corn.....	.15	.33	.41	.50	4.84	78.6	1.98
Sorghum Fodder	.09	.23	.23	.28	.....	82.2	1.16
Rye Fodder.....	.15	.73	.33	.40	.....	62.1	2.08
Oat Fodder.....	.13	.38	.49	.60	1.31	83.4	2.31
Timothy Grass.....	.26	.76	.48	.58	2.15	66.9	2.76
Red Clover.....	.13	.46	.53	.64	.....	80.0	2.51
White Clover.....	.20	.24	.56	.68	.....	81.0	2.48
Alsike Clover.....	.11	.20	.44	.53	1.47	81.8	1.90
Scarlet Clover.....	.13	.49	.43	.52	.....	82.5	2.18
Alfalfa (lucern)	.13	.56	.72	.87	2.25	75.3	3.30
Cow pea.....	.10	.31	.27	.33	1.47	78.8	1.40
Soja Bean.....	.15	.53	.29	.35	.....	73.2	1.73
Prickly Comfrey.....	.11	.75	.43	.51	2.45	84.4	2.39
Corn Silage.....	.11	.37	.28	.34	.....	78.0	1.50

MATERIAL.	Phosphoric Acid.	Potash	Nitrogen.	Nitrogen Equivalent to Ammonia.	Ash.	Water.	Comparative Value of Fertilizing Ingredients
	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	
HAY AND DRY COARSE FODDERS.							
Fodder Corn (with ears).....	.54	.89	1.76	2.14	4.91	7.85	\$ 7.85
Corn Stover (without ears)	.29	1.40	1.04	1.26	3.74	9.12	5.47
Hungarian Grass.....	.35	1.30	1.20	1.46	6.18	7.69	6.03
Common Millet.....	.49	1.69	1.28	1.55	.....	9.75	6.83
Hay of Mixed Grasses.....	.27	1.55	1.41	1.71	6.34	11.99	6.95
Red Top.....	.36	1.02	1.15	1.40	4.59	7.71	5.58
Timothy	.53	.90	1.26	1.53	4.93	7.52	6.02
Red Clover.....	.38	2.20	2.07	2.51	6.93	11.33	10.11
Mammoth Red Clover.....	.55	1.22	2.23	2.71	8.72	11.41	9.90
White Clover.....	.52	1.81	2.75	3.34	.....	.....	12.35
Scarlet Clover.....	.40	1.31	2.05	2.49	7.70	18.30	9.18
Alsike Clover.....	.67	2.23	2.34	2.85	11.11	9.94	11.45
Alfalfa.....	.51	1.68	2.19	2.66	7.07	6.55	10.17
Barley Straw.....	.30	2.09	1.31	1.59	5.30	11.44	7.16
Barley Chaff.....	.27	.99	1.01	1.23	.....	13.08	4.95
Wheat Straw	.12	.51	.59	.72	3.81	12.56	2.79
Wheat Chaff.....	.70	.42	.79	.96	7.18	8.05	4.00
Rye Straw.....	.28	.79	.46	.55	3.25	7.61	2.72
Oat Straw... ..	.20	1.24	.62	.75	4.76	9.09	3.69
Buckwheat Hulls.....	.07	.52	.49	.59		11.90	2.36
Cowpea (whole plant)	.59	1.47	1.95	2.37	8.40	10.95	9.10

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MATERIAL.	Phosphoric Acid.	Potash.	Nitrogen.	Nitrogen Equivalent to Ammonia.	Ash.	Water.	Comparative Value of Fertilizing Ingredients.
ROOTS, BULBS, TUBERS, ETC.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	
Potatoes.....	.12	.46	.32	.39	.89	79.24	\$1.75
Sweet Potatoes.....	.08	.37	.24	.29	1.00	71.26	1.32
Red Beets.....	.09	.44	.24	.29	1.13	87.73	1.40
Yellow Fodder Beets.....	.09	.46	.19	.23	.95	90.60	1.24
Sugar Beets.....	.10	.48	.22	.26	1.04	86.95	1.36
Mangel-Wurzels.....	.09	.38	.19	.23	1.22	87.29	1.16
Turnips.....	.10	.39	.18	.23	1.01	89.49	1.18
Rutabagas.....	.12	.49	.19	.23	1.06	89.13	1.30
Carrots.....	.09	.51	.15	.18	1.22	89.79	1.14
GRAINS AND OTHER SEEDS.							
Corn.....	.70	.40	1.82	2.21	1.53	10.88	7.73
Sorghum Seed.....	.81	.42	1.48	1.80	.....	14.00	6 63
Barley.....	.79	.48	1.51	1.83	2.48	14.30	6 76
Oats.....	.82	.62	2.06	2.50	2.98	18.17	8.94
Wheat, Spring.....	.70	.39	2.36	2.87	1.57	14.35	9.70
Wheat, Winter.....	.89	.61	2.36	2.87	.....	14.75	10.11
Rye.....	.82	.54	1.76	2.14	.....	14.90	7.78
Millet, Common.....	.85	.36	2.04	2.48	.....	12.68	8 65
Japanese Millet.....	.69	.38	1.73	2.18	.....	13.68	7.61
Rice.....	.18	.09	1.08	1.31	.82	12.60	4.20

MATERIAL.	Phosphoric Acid.	Potash.	Nitrogen.	Nitrogen Equivalent to Ammonia.	Ash.	Water.	Comparative Value of Fertilizing Ingredients.
	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	
Buckwheat.....	.44	.21	1.44	1.75	.....	14.10	\$ 5.90
Soja Beans.....	1.87	1.99	5.30	6.44	4.99	18.33	23.18
OTHER CONCENTRATED FEEDS.							
Corn Meal.....	.63	.40	1.58	1.92	1.41	12.95	6.79
Corn and Cob Meal.....	.57	.47	1.41	1.71	.....	8.96	6.17
Ground Oats.....	.77	.59	1.86	2.26	3.37	11.17	8 14
Ground Barley.....	.66	.34	1.55	1.88	2.06	13.43	6.64
Wheat Flour.....	.57	.54	2.21	2.68	1.22	9.83	9.15
Pea Meal.....	.82	.99	3.08	3.74	2.68	8.85	13.03
Corn Cobs.....	.06	.60	.50	.61	.82	12.09	2.49
Hominy Feed.....	.98	.49	1.63	1.98	2.21	8.93	7.41
Gluten Meal.....	.33	.05	5.03	6.14	.73	8.59	18.82
Starch Feed (glucose refuse)...	.29	.15	2.62	3.18	.....	8.10	9.98
Malt Sprouts.....	1.43	1.63	3.55	4.31	12.48	18.38	15.99
Brewers' Grains, Dry.....	1.03	.09	3.62	4.40	3.93	9.14	14.32
Brewers' Grains, Wet.....	.31	.05	.89	1.08	.....	75.01	3.60
Rye Bran.....	2.28	1.40	2.32	2.82	4.60	12.50	12.14
Rye Middlings.....	1.26	.81	1.84	2.23	3.52	12.54	8.76
Wheat Bran.....	2.89	1.61	2.67	3.24	6.25	11.74	14.22

MATERIAL.	Phosphoric Acid.	Potash.	Nitrogen.	Nitrogen Equivalent to Ammonia.	Ash.	Water.	Comparative Value of Fertilizing Ingredients.
	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	Per Ct.	
Wheat Middlings.....	.95	.63	2.63	3.19	2.30	9.18	\$11.15
Rice Bran.....	.29	.24	.71	.86	12.94	10.20	3.11
Rice Polish.....	2.67	.71	1.97	2.39	9.00	10.30	10.55
Buckwheat Middlings.....	.68	.34	1.38	1.63	1.40	14.70	6.06
Cottonseed Meal.....	2.88	.87	6.79	8.24	6.95	7.81	28.47
Cottonseed Hulls.....	.25	1.02	.69	.84	2.40	10.17	3.79
Linseed Meal (old process)....	1.66	1.37	5.43	6.59	6.08	8.88	22.80
Linseed Meal (new process)....	1.83	1.39	5.78	6.92	5.37	7.77	23.98
Apples, Fruit.....	.01	.19	.13	.16	.39	85.30	.68
Apple Pomace.....	.02	.13	.23	.28	.27	80.50	.99
DAIRY PRODUCTS, ETC.							
Whole Milk.....	.19	.18	.53	.64	.75	87.00	2.29
Skim Milk.....	.20	.19	.56	.68	.80	90.25	2.43
Cream.....	.15	.13	.40	.48	.50	74.05	1.72
Buttermilk.....	.17	.16	.48	.58	.70	90.50	2.07
Whey.....	.14	.18	.15	.18	.60	93.97	.86
Butter.....	.04	.04	.12	.39	.15	11.50	1.25
Cheese.....	.60	.12	3.93	4.77	2.10	33.25	15.03
Live Cattle.....	1.76	.16	2.48	3.01	4.40	50.20	10.95
Sheep.....	1.13	.14	1.95	2.37	2.90	44.80	8.38
Swine.....	.73	.10	1.76	2.14	1.80	42.00	7.25

Table III.**Exhaustion of Fertilizers (Scotch Authority) On Cultivated Clay Loam.**

KIND OF FERTILIZER.	Exhausted (In Years.)	Per Cent. Remaining in the Soil Unexhausted at End of Each of First Six Years.					
		1	2	3	4	5	6
Lime.....	12	80	65	55	45	35	25
Bone Meal.....	5	60	30	20	10	....	....
Phosphatic Guano.....	5	50	30	20	10	....	....
Dissolved Bones and Plain Super-Phosphates.	4	20	10	5	....	....	....
High Grade Ammon. Fertilizers, Guanos, etc.	3	30	20	....	....	....	....
Cotton-Seed Meal.....	5	40	30	20	10	....	....
Stable Manure....	5	60	30	20	10	....	....

On Cultivated Light or Medium Soils.

Lime.....	10	75	60	40	30	20	15
Bone Meal.....	4	60	30	10	....	....	....
Phosphatic Guanos.....	4	50	20	10	....	....	....
Dissolved Bones and Plain Super Phosphates	3	20	10	5	....	....	....
High Grade Ammoniated Guanos.....	3	30	20	....	....	....	....
Cotton Seed Meal.....	4	40	30	20	10	....	....
Stable Manure.....	4	60	30	10	....	....	....

Table III.—Cont.**Exhaustion of Fertilizers.**

(Scotch Authority.)

On Cultivated Pasture Land.

KIND OF FERTILIZER.	Exhausted (In Years.)	Per Cent. Remaining in the Soil Unexhausted at End of Each of First Six Years.					
		1	2	3	4	5	6
Lime.....	15	80	70	60	50	45	40
Bone Meal.....	7	60	50	40	30	20	10
Phosphatic Guanos.....	6	50	40	30	20	10	....
Dissolved Bone, etc.....	4	30	20	10	....	....	....
High-Grade Ammoniated Guanos	4	30	20	10	....	....	....
Cotton Seed Meal.....	5	40	30	20	10	...	...
Stable Manure.....	7	60	50	40	30	20	10

TABLE IV.
Amount of Fertilizing Materials Contained In Different Crops Grown On One Acre (Van Slyke).

KIND OF CROPS.	Yield of Grain, Fruit, Etc.	Yield of Straw, etc.	Pounds of Phos- phoric Acid.	Pounds of Pot- ash.	Pounds of Nitro- gen.	Pounds of Am- monia (N. X. ¹⁷ / ₁₄)
Apples.....	10 to 20 tons.	1,350 to 2,700 lbs.	2 to 4	40 to 80	26 to 52	32 to 63
Barley.....	20 to 40 bus.	1,800 to 3,600 lbs.	11.5 to 23	34 to 68	37 to 74	45 to 90
Beans.....	20 to 40 bus.	1,800 to 3,600 lbs.	20 to 40	35 to 70	50 to 100	61 to 121
Buckwheat.....	15 to 30 bus.	1,200 to 2,400 lbs.	10.5 to 21	30 to 60	26.5 to 53	32.2 to 64
Cabbage.....	15 to 30 tons.	7.5 to 15 tons.	35 to 70	135 to 270	100 to 200	121 to 243
Clover, crimson, (green)	.....	.....	20 to 40	70 to 140	65 to 130	79 to 158
Clover, red, hay.....	.....	1 to 2 tons.	9 to 18	44 to 88	41 to 82	50 to 100
Corn, (grain alone)....	30 to 60 bus.	2,500 to 5,000 lbs.	16 to 32	17 to 34	42 to 84	51 to 102
Grapes.....	1 to 2 tons.	3,000 to 6,000 lbs.	18 to 36	26 to 52	7 to 14	9 to 17
Hops, (whole crop) ..	1,600 to 3,200 lbs.	1 to 2.5 tons.	28 to 56	32 to 64	40 to 80	49 to 97
Mixed Hay.....	.....	.....	7 to 17.5	31 to 77	28 to 70	34 to 85
Oats.....	30 to 60 bus.	1,600 to 3,200 lbs.	11 to 22	25 to 50	30 to 60	36 to 73
Onions.....	8 to 16 tons.	.....	10 to 20	20 to 40	28 to 56	34 to 68
Pears.....	15 to 30 bus.	1,500 to 3,000 lbs.	5 to 10	13 to 26	16 to 32	19 to 38
Peas.....	4 to 8 tons.	.....	16.5 to 33	26 to 52	54 to 108	66 to 132
Plums.....	100 to 200 bus.	750 to 1,500 lbs.	2 to 4	20 to 40	15 to 30	18 to 36
Potatoes.....	10 to 30 bus.	2,100 to 4,200 lbs.	10 to 20	31 to 62	16.5 to 33	20 to 40
Rye.....	300 to 600 bus.	3,000 to 6,000 lbs.	13 to 26	21 to 42	24.5 to 49	30 to 60
Sugar Beets.....	.....	1 to 2 tons.	20 to 40	95 to 190	55 to 110	67 to 134
Timothy Hay.....	800 to 1,600 lbs. leaves	700 to 1,400 lbs. stems.	10 to 20	30 to 60	25 to 50	27 to 54
Tobacco.....	5 to 10 tons.	.....	8 to 16	100 to 200	38 to 76	46 to 92
Tomatoes.....	350 to 700 bus.	2.25 to 5 tons.	10 to 20	27 to 54	16 to 32	19 to 38
Turnips.....	15 to 30 bus.	1,600 to 3,200 lbs.	26 to 52	90 to 180	40 to 80	49 to 97
Wheat.....	.....	.....	10 to 20	13 to 26	31 to 62	38 to 75

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6340	Alexandria Fertz. & Chem. Co., Alexandria, Va.	Alkaline Bone.....	Hancock.....
6305	" " "	Dissolved S. C. Bone....	Gaithersburg.....
6281	A. Anderson & Co., Mt. Airy, Md.	Harvest Queen Guano...	Mt. Airy.....
6239	Armour Fertilizing Works, Chicago, Ill.	Grain Growers.....	Baltimore.....
6766	" " "	Grain Grower.....	Rock Hall.....
6547	" " "	Tankage.....	Sellman.....
6247	" " "	Wheat Special... ..	Baltimore.....
6410	Baltimore Guano Co., Baltimore, Md.	B. G. Ammoniated Bone Phos.	Cambridge
6409	" " "	Farmer's Dis. Bone.....	Cambridge
6270	Baltimore Pulverizing Co., Baltimore, Md.	Farmer's Favorite Fertz.	Watersville
6440	" " "	Penniman's Excelsior Fertilizer.	Denton.....
6225	" " "	Penniman's Special Guano No. 1.	Baltimore.....
6349	" " "	Penniman's Universal Fertilizer.	Baltimore.....
6220	" " "	Special Fall Mixture....	Baltimore.....
6271	" " "	Special Potato Manure..	Watersville.....
6386	Baltimore Seed & Implement Co., Baltimore, Md.	H. G. Acid Phosphate..	Parkton.....
6379	Baugh & Sons Co., Baltimore, Md.	Animal Bone and Potash Comp.	North East.....
6230	" " "	Bone and Potash Comp. for all Crops	Baltimore.....
6288	" " "	Day's Animal Bone Phosphate.	Monrovia.....
6263	" " "	Double Eagle Phosphate.	Hoods Mills.....
6367	" " "	Double Eagle Phosphate.	Baltimore.....
6248	" " "	Excelsior Super-Phos....	Baltimore.....
6301	" " "	Export Bone with Potash.	Gaithersburg.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6340	.....	.....	2.76	2½	1.35	10.49	10	11.84	.....	\$11.44	\$10.80
6305	.....	.....	.....	.....	.85	14.14	14	14.99	.....	11.31	11.20
6281	1.14	1	1.50	1	4.75	8.07	9	12.82	.....	14.84	13.40
6239	2.07	2	2.05	2	3.52	7.87	8	11.39	10	17.54	16.80
6766	2.06	2	2.03	2	1.22	9.50	8	10.72	10	18.20	16.00
6547	9.04	8	.....	.....	.....	.....	.....	9.27	.....	27.26	19.20
6247	1.28	1	1.22	1	2.21	8.59	8	10.80	10	15.53	12.80
6410	2.18	2½	2.35	3	1.72	10.72	10	12.44	13	20.30	21.70
6409	.....	.....	.....	.....	2.17	14.33	13	16.50	15	11.46	10.40
6270	.92	1	2.03	.....	1.15	5.36	5½	6.51	11	9.31	10.75
6440	.....	.....	2.72	6	.95	10.96	10	12.91	.....	11.68	14.00
6225	1.46	1	2.21	1	2.16	6.34	8	8.50	.....	13.79	12.00
6349	1.89	2	2.39	1	1.97	9.55	8	11.42	.....	18.40	15.00
6220	.....	.....	2.01	2	1.82	8.02	8	9.84	9	8.79	8.60
6271	2.49	2	4.19	4	1.12	5.14	5½	6.25	.....	17.24	15.25
6386	.....	.....	.....	.....	1.65	14.95	14	16.60	15	11.96	11.20
6379	2.54	2	2.08	2	2.12	8.21	8	10.33	10½	18.75	17.00
6230	2.01	2	2.07	2	2.25	9.31	8	11.56	10½	18.29	17.00
6283	2.66	2	2.88	2	1.25	10.06	8	11.31	.....	21.42	16.00
6263	2.64	2½	.97	½	3.12	8.77	8	11.89	10½	18.91	18.00
6367	2.69	2½	.95	½	2.55	9.01	8	11.56	10½	19.05	17.00
6248	2.72	2	5.75	6	1.72	10.19	10	11.91	.....	24.79	22.00
6301	2.50	2	2.45	2	8.	3.91	11	11.91	.....	17.06	19.00

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6232	Baugh & Sons Co., Baltimore, Md.	General Crop Growers for all Crops.	Baltimore.....
6300	" " "	Genuine Lobos Peruvian Guano.	Gaithersburg.....
6231	" " "	H. G. Acid Phosphate or S. C. Rock.	Baltimore.....
6298	" " "	New Process Dis. Bone..	Gaithersburg.....
6264	" " "	Pure Dis. Animal Bone..	Hoods Mills.....
6267	" " "	Soluble Alkaline Super-Phosphate.	Hoods Mills.....
6503	" " "	S. C. Rock.....	Copperville.....
6268	" " "	Special Potato Manure..	Hoods Mills.....
6504	" " "	Tankage.....	Copperville.
6299	" " "	The Old Stand-by Raw Bone Super-Phos.	Gaithersburg.....
6381	" " "	Tomato Compound.....	North East.....
6257	" " "	Wheat Fertz. for Wheat and Grass.	Ellicott City.....
6378	" " "	Wheat Fertz. for Wheat and Grass.	North East.....
6413	Beck, Walker & Brown, Chestertown, Md.	Propagator Super-Phos..	Chestertown.....
6767	" " "	Propagator.....	Rock Hall.....
6412	" " "	Trustworthy Super-Phos.	Chestertown.....
6414	" " "	Try-Me Super-Phos.....	Chestertown.....
6289	A. D. Bireley & Son, La-diesburg, Md.	Ammoniated Bone Phosphate.	Harmony Grove....
6506	" " "	Ammon. Bone Phos.....	Double Pipe Creek
6291	" " "	Dissolved Bones.....	Walkersville.....
6319	Chas. E. Bond, Spencer-ville, Md.	Dissolved Phos. Rock....	Spencerville.....
6326	John Burgoon, Union Mills, Md.	X X Animal Bone Phos..	Westminster.....
6314	Chemical Co. of Canton, Baltimore, Md.	Baker's Pure Dis. S. C. Bone	Baltimore.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6232	1.42	1	2.17	1	1.25	8.68	8	9.93	.....	\$15.61	\$12.00
6300	4.55	8½	3.30	2½	11.92	11.50	12	23.42	.....	33.22	29.40
6231	.....	.....	.....	.....	1.55	14.35	14	15.90	.....	11.48	11.20
6298	2.97	2½	.....	.....	1.54	10.84	10	12.38	....	20.21	17.50
6264	2.94	2½	.....	.....	4.07	13.59	13	17.66	16	24.04	21.70
6267	.....	.....	2.61	2	2.95	10.20	10	12.15	.....	11.36	10.00
6503	.....	.....	.....	.....	1.39	16.12	14	17.51	.....	12.90	11.20
6268	2.64	3	11.08	10	1.27	6.08	5	7.35	7½	25.59	25.00
6504	6.34	6	.....	.....	.....	.....	.....	9.	.....	20.62	14.40
6299	2.03	2	1.37	1	2.95	8.04	8	10.99	.....	16.68	16.00
6381	2.28	2	2.12	2	2.20	8.79	8	10.99	.....	18.63	16.80
6257	2.14	2	2.34	2	2.35	8.28	8	10.63	11	17.98	17.20
6378	2.11	2	2.45	2	2.45	8.76	8	11.21	11	18.52	17.20
6418	2.30	2	3.67	2½	2.00	8.14	8	10.14	.....	19.51	16.50
6767	2.83	2	2.59	2½	2.55	8.49	8	11.04	.....	20.59	18.12
6412	3.85	3	4.30	4	1.22	10.54	8	11.76	.....	26.88	21.00
6414	.....	.....	3.54	3½	3.37	10.84	10	14.21	.....	12.88	11.90
6289	.84	½	1.43	1	1.45	8.85	8	10.30	.....	11.32	8.10
6506	1.08	½	1.43	1	1.46	11.99	8	13.45	.....	17.24	8.90
6291	2.06	2	.....	.....	2.10	9.72	10	11.82	.....	16.74	16.00
6319	.....	.....	.....	.....	4.92	15.21	14	20.13	.....	12.17	11.20
6326	1.23	1	2.73	2	3.17	8.09	8	11.26	10	15.78	13.80
6314	.....	.....	.....	.....	3.05	13.51	14	16.56	.....	10.81	11.20

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6224	Chemical Co. of Canton, Baltimore, Md.	Baker's Special Wheat, Corn & Grass Mixture.	Baltimore
6284	" " " "	Bone and Potash.	Monrovia.....
6337	" " " "	Dissolved Animal Bone.	Chewsville.....
6325	" " " "	Gem Phosphate.....	Westminster.....
6356	" " " "	Harrow Brand Crop Grower.	Baltimore.....
6261	" " " "	Patrons' Bone Mixture..	Sykesville.
6310	" " " "	Pure Dissolved S. C. Bone.	Baltimore.....
6411	" " " "	Pure Dissolved S. C. Bone.	Cambridge.....
6439	Clark Cove Fertz. Co, New York.	King Philip's Alkaline Guano.	Denton.....
6402	Josiah Cope, Lincoln University.	Ammoniated Bone Phos.	Rising Sun.....
6442	F. P. Covey, Federalsburg, Md.	Covey's Standard Bone Phosphate.	Federalsburg.....
6288	Crocker Fertz. & Chem. Co., Buffalo, N. Y.	Practical Ammon. Super-Phosphate.	Harmony Grove....
6272	Cutshall & Fogle, Woodsboro, Md.	Ammoniated Bone Phos.	Mt. Airy.....
6360	Wm. Davison & Co., Baltimore, Md.	Boss Ammoniated Super-Phosphate.	Belair.....
6221	" " " "	Dissolved S. C. Bone....	Baltimore.....
6227	" " " "	High Grade Ammon. Super-Phosphate.	Baltimore.....
6361	" " " "	Pen-Mar Ammoniated Bone Phosphate.	Belair.....
6287	E. E. DeLashmutt, Frederick, Md.	Fish and Bone Mixture..	Frederick.....
6286	" " " "	"Mixture".....	Frederick.....
6320	Detrick Fertz. & Chem. Co., Baltimore, Md.	Ammon. Super-Phos....	Hampstead
6430	" " " "	Bone and Potash.....	Centreville.....
6425	" " " "	Bone Phosphate and Potash Fertz.	Chestertown.....
6202	" " " "	Farmers' Friend.....	Frederick.....

FERTILIZER ANALYSES.

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No.	NITROGEN Calculated as AMMONIA.		POTASH K ₂ O.		PHOSPHORIC ACID.						Comparative value per Ton Found.	Comparative Value per Ton Guaranteed.
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.				
						Found.	Guaranteed.	Found.	Guaranteed.			
6224	1.29	1	2.83	2	2.50	9.13	9	11.63	11	\$16.83	\$14.80	
6284	.....	.....	2.26	2	2.44	10.52	10	12.96	.....	11.17	10.00	
6337	2.29	2½	.....	.....	3.15	10.84	12	13.99	.....	18.97	19.50	
6325	.....	.....	.....	.....	1.42	15.24	13	16.66	.....	12.19	10.40	
6356	1.09	1	1.43	1	2.32	7.98	8	10.30	.....	13.61	12.00	
6261	2.93	2	2.99	2½	6.92	5.39	5	12.31	15	19.94	17.50	
6310	.....	.....	.....	.....	1.75	14.07	14	15.82	.....	11.26	11.20	
6411	.....	.....	.....	.....	2.35	14.70	14	17.05	.....	11.76	11.20	
6439	1.72	1½	3.47	3	2.85	9.60	6	12.45	7	19.37	13.90	
6402	1.30	1	2.67	3	.60	12.10	10	12.70	.....	18.91	16.80	
6442	1.55	1½	2.63	2	2.15	12.01	9	14.16	11	20.15	16.30	
6288	1.23	1	1.51	1.03	1.52	9.52	8	11.04	.....	15.33	12.43	
6272	1.20	1	1.16	1	1.75	8.90	8	10.65	.....	14.36	12.00	
6360	2.62	2½	2.07	2½	2.72	11.56	8	14.28	11	22.58	19.20	
6221	.....	.....	.....	.....	.72	13.97	14	14.69	16	11.18	11.20	
6227	3.01	2 75	2.97	2½	2.92	12.25	10	15.17	13	25.42	22.20	
6361	1.64	1.40	2.70	2½	3.32	8.92	8	12.24	10	17.87	15.50	
6287	2.08	2	.....	.....	2.22	9.91	10	12.13	11	17.04	16.40	
6286	.66	½	1.74	1½	1.12	6.76	7	7.88	.....	9.35	8.80	
6320	2.56	2½	1.52	2½	3.60	10.33	10	13.93	.....	20.97	20.80	
6430	.....	.....	1.51	1	1.62	13.64	12	15.26	.....	12.74	10.60	
6425	.....	.....	2.09	3	1.97	10.27	10	12.24	.....	10.71	11.40	
6202	1.27	1	1.27	1	2.85	9.67	8	12.52	.....	15.89	12.80	

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6278	Detrick Fertz. & Chem Co.	Farmers' New Method...	Mt. Airy.....
6280	" " " "	Royal Crop Grower.....	Mt. Airy.....
6269	" " " "	Soluble Bone Phosphate and Potash.	Woodbine.....
6203	" " " "	South Carolina Bone...	Frederick.....
6379	" " " "	Special Compound.....	Mt. Airy.....
6420	" " " "	Special Mixture.....	Chestertown.....
6365	L. F. Detrick, Baltimore, Md.	Bone and Potash Mixture	Baltimore.....
6364	" " " "	K. K. K Kangaroo Komplete Kompound, Ammoniated Phosphate.	Baltimore.....
6255	Joshua W. Dorsey, Ellicott City, Md.	"D" Mixture	Ellicott City.....
6259	" " " "	"D" Mixture	Ellicott City.....
6421	T. W. Eliason, Chestertown, Md.	No. 1 Am. Super-Phos. of Lime and Potash.	Chestertown.....
6424	" " " "	M. P. Dis. Bone Phos. S. C. and Muriate of Pot'h	Chestertown.....
6422	" " " "	Our Special Dis. Alkaline Phos. and Potash.	Chestertown.....
6324	D. Englar, Jr., Medfords, Md.	No. 3 Bone Phosphate...	Medfords.....
6211	Englar & Rhinehart, Linwood, Md.	No. 1 Ammoniated Bone Phosphate.	Linwood.....
6210	" " " "	No. 2 Ammoniated Bone Phosphate.	Linwood.....
6400	Eureka Fertilizing Co., Perryville, Md.	Alkaline Bone and Potash.	Rising Sun.....
6401	" " " "	Fish Rock and Potash...	Rising Sun.....
6377	" " " "	Fish Rock and Potash...	Leslie.....
6390	" " " "	"B. & P." Super-Phosphate.	Monkton.....
6391	" " " "	Pure Dissolved Bone...	Monkton.....
6313	W. S. Farmer & Co., Baltimore, Md.	B. & P. Fertilizer.....	Baltimore.....
6406	" " " "	Clyde Brand.....	Cambridge.....

No.	NITROGEN Calculated as AMMONIA.		POTASH K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6278	2.82	2½	.....	.....	4.07	9.37	8	13.44	.....	\$19.46	\$15.90
6280	1.89	2	2.45	2	2.80	9.12	8	11.92	9	18.36	16.40
6269	.....	.....	2.37	2	3.25	11.26	10	14.51	14	12.03	10.40
6203	.....	.....	.....	.....	1.82	14.47	14	16.29	.....	11.58	11.20
6279	1.26	1	1.04	1	2.92	9.32	9	12.24	10½	15.31	13.60
6420	1.15	1	1.22	1	2.75	10.18	8	12.93	.....	15.95	12.80
6365	.....	.....	2.39	2½	2.82	10.22	10	13.04	.....	11.12	10.25
6364	2.22	2	3.03	3	4.10	8.80	8	12.90	.....	20.33	17.00
6255	1.90	1½	1.98	1½	1.12	8.28	8	9.40	.....	16.41	14.50
6259	2.93	2½	3.38	4	1.07	10.09	9	11.16	.....	22.69	20.15
6421	2.01	1½	2.43	1	1.20	12.70	9	13.90	.....	21.64	15.50
6424	.....	.....	2.70	2½	.48	14.48	13	14.96	.....	14.38	13.40
6422	.....	.....	2.29	1½	1.27	13.56	11	14.83	.....	13.38	10.70
6324	1.62	1¼	2.32	2	1.85	10.54	9½	12.39	11	18.46	15.85
6211	3.51	2.50	1.39	1.34	3.10	9.36	11.31	12.46	.....	22.52	20.15
6210	2.07	1.80	2.14	1.83	2.15	9.67	11.99	11.82	....	18.88	19.22
6400	.....	.....	2.10	2	3.32	11.04	11	14.36	12	11.59	11.00
6401	.53	½	2.03	1	3.60	8.29	8	11.89	9	10.97	9.10
6377	.52	½	1.10	1	3.05	9.73	8	12.78	9	11.05	9.10
6390	.....	.....	.....	.....	2.62	13.97	14	16.59	15	11.17	11.20
6391	1.38	2	.....	.....	4.22	11.13	12	15.25	15	16.95	19.20
6313	.....	.....	1.99	2½	.80	11.99	10	12.79	.....	11.75	10.80
6406	1.08	1	2.72	2½	1.82	10.30	9	12.12	.....	16.99	14.90

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6408	W. S. Farmer & Co., Baltimore, Md.	Dissolved S. C. Bone.....	Cambridge.....
6311	" " "	Harvest Queen Phos	Baltimore.....
6405	" " "	Ten Per Cent. Vegetable Guano.	Cambridge.....
6216	Farmers' Fertilizing Co., Westminister, Md.	Acid Phosphate.....	Westminster.
6213	" " "	No. 1 Bone Phosphate...	Westminster.....
6217	" " "	No. 2 Bone Phosphate...	Westminster.....
6215	" " "	No. 3 Bone Phosphate...	Westminster.....
6214	" " "	X X Bone Phosphate.....	Westminster.
6212	N. I. Gorsuch & Sons, Westminister, Md.	No. 3 Bone X X X X	Westminster.....
6302	Griffith & Boyd, Baltimore, Md.	Cereal Bone Plant Food.	Gaithersburg.....
6303	" " "	Harvest Queen Phos.....	Gaithersburg.....
6260	" " "	High-Grade Acid Phos...	Ellicott City.....
6393	" " "	Peerless Fertz.....	Corbett.....
6345	" " "	Pure Dissolved Animal Bone.	Baltimore.....
6387	" " "	Spring Crop Grower....	Parkton.....
6329	Hanover Bone Fertz. Co., Hanover, Pa.	Blood and Bone Com-pound.	Westminster.....
6294	" " "	Dissolved Bone Phos.....	Taneytown.....
6293	" " "	Dissolved S. C. Rock	Taneytown.....
6330	" " "	Farmers' Crop Winner...	Westminster.....
6362	Hanway & Keen, Belair, Md.	H. & K. Special Mixture.	Belair.....
6363	" " "	H. & K. Standard.....	Belair.....
6375	S. M. Hess & Bro., Phila., Pa.	H. G. Guano. Keystone Bone Phos.....	Leslie.....
6374	" " "	Potato and Truck Manure.	Leslie.....

FERTILIZER ANALYSES.

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No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6408					1.77	14.40	14	16.17	.....	\$11.52	\$11.20
6311	1.54	1½	3.43	2½	2.02	10.38	10	12.40	.....	19.24	17.60
6405	8.56	10	3.42	3	1.75	7.01	6	8.76	.....	36.87	39.40
6216					1.14	15.26	14	16.40	.....	12.21	11.20
6213	3.22	2½	4.23	2½	1.10	8.14	9	9.27	11	22.50	19.80
6217	2.24	2	2.60	2½	1.80	9.16	9	10.46	10	19.00	17.90
6215	2.28	1¾	2.75	2½	.80	9.17	9	9.97	11	19.08	17.55
6214	1.46	1	3.07	3	.89	9.81	9	10.70	10	16.82	15.40
6312	.46	25	2.18	1.50	1.97	8.29	8	10.26	9	10.58	8.85
6302	1.05	1	2.35	2	1.72	8.30	8	10.02	10	14.49	13.80
6303	1.66	1½	2.86	2½	1.97	9.80	10	11.77	.....	18.42	17.60
6260					1.30	14.34	14	15.64	15	11.47	11.20
6393	.37	¼	2.96	2	1.77	8.69	8	10.46	9	11.37	9.37
6345	1.81	2½			1.77	13.40	10	15.17	11	19.54	17.90
6387	2.13	2	4.65	4½	2.17	7.21	6½	9.38	8	19.48	17.40
6329	1.31	1	2.19	2	2.00	10.05	8	12.05	.....	16.97	13.40
6244			1.68	2	1.40	11.86	10	13.26	11	11.45	10.20
6293					1.62	14.60	14	16.22	15	11.68	11.20
6330	.74	½	1.78	1½	1.20	7.40	7	8.60	.....	10.16	8.80
6362	1.42	1	2.05	2	2.80	8.45	9	11.25	11	15.88	14.00
6363	2.42	2½	2.45	2½	2.32	9.19	8	11.51	.....	19.82	18.00
6375	1.03	1	1.04	1	2.25	9.60	9	10.85	.....	14.53	13.80
6374	2.13	3.00	5.94	6.00	1.70	8.53	8.00	10.23	.....	21.71	23.00

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6376	S. M. Hess & Bro., Phila., Pa.	Soluble Bone and Potash	Leslie.....
6441	Leander R. Hooper, Easton, Md.	H. G. Soluble Bone and Potash.	Denton.....
6282	W. H. Hood, Mt. Airy, Md.	Special Mixture.....	Mt. Airy.....
6219	Joshua Horner, Jr., & Co., Baltimore, Md.	Ammoniated Raw Bone Super-Phosphate.	Baltimore.....
6228	" " "	Dissolved S. H. Bone Dust.	Baltimore.....
6244	M. P. Hubbard & Co., Baltimore, Md.	Farmers' Old Economy..	Baltimore.....
6245	" " "	Harvest King for Wheat and Grass.	Baltimore.....
6218	" " "	H. G. Soluble S. C. Phosphate.	Baltimore.....
6277	Hubbard & Co., Baltimore, Md.	Columbia Gem Phos.....	Mt. Airy.....
6223	" " "	Farmers' I X L Super-Phosphate.	Baltimore.....
6290	" " "	H. G. Soluble S. C. Rock.	Walkersville.....
6273	" " "	Oriental Phosphate	Mt. Airy.....
6276	" " "	Soluble Bone and Potash.	Mt. Airy.....
6275	" " "	Standard Bone Super-Phosphate.	Mt. Airy.....
6274	" " "	Wheat Growers' Jewel...	Mt. Airy.....
6416	T. R. Hubbard & Son, Chestertown, Md.	Imperial Compound Phosphate.	Chestertown.....
6417	" " "	Our Special 10 per cent..	Chestertown.....
6418	" " "	Special Mixture.....	Chestertown.....
6415	" " "	Victor Phosphate.....	Chestertown.. ..
6334	C. M. Keedy, Keedysville, Md.	Money-Saving Phos.....	Keedysville.....
6316	S. L. Lamberd, Baltimore, Md.	Boss Fertilizer.....	Baltimore.....
6249	Lazaretto Guano Co., Baltimore, Md.	Alkaline Bone.....	Ellicott City.....
6250	" " "	Ammoniated Bone Phosphate.	Ellicott City.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6376	.....	.....	1.01	1	2.90	9.62	10	12.52	.....	\$ 9.28	\$ 9.20
6441	.....	.....	2.24	2	1.20	10.85	10	12.05	.....	11.16	10.40
6282	1.13	1	2.47	2	1.27	9.97	9	11.24	.....	16.34	14.00
6319	2.60	2½	2.63	2½	3.44	8.63	8	12.07	.....	20.43	19.60
6228	2.97	2½	.....	.....	3.45	11.56	12	15.01	.....	22.25	20.70
6244	.61	¼	1.99	1½	.70	8.34	8	9.04	10	10.63	9.80
6245	1.50	1½	2.15	1½	.47	9.66	9	10.13	10½	16.49	15.60
6218	.....	.....	.....	.....	.32	15.29	14	15.61	.....	12.23	11.20
6277	.88	½	1.93	1½	2.42	7.98	8	10.40	.....	11.45	8.30
6223	2.03	2	2.05	1.75	2.80	10.14	7	12.94	.....	19.40	15.35
6290	.....	.....	.....	.....	1.27	15.24	14	16.51	.....	12.19	11.20
6273	1.30	1	1.81	1½	1.50	9.22	9	10.72	.....	15.53	14.30
6276	.....	.....	2.01	2	2.67	9.16	10	11.83	11	9.87	10.00
6275	2.20	2	2.01	2	3.40	9.21	9	12.61	.....	19.18	17.40
6274	1.47	1½	1.93	1½	2.20	10.51	10	12.71	.....	17.73	16.40
6416	1.90	1¾	3.74	2½	1.95	11.50	9	13.45	.....	21.72	17.55
6417	4.86	3	9.38	10	1.50	9.00	6	10.50	.....	33.56	25.00
6418	2.04	1½	2.93	3	1.05	12.35	9	13.40	.....	21.82	16.50
6415	1.22	1	2.35	3	1.80	9.85	8	11.65	.....	16.58	14.80
6334	1.45	1½	3.95	3	3.60	9.57	20	13.17	.....	19.31	27.50
6316	2.16	2	4.23	4½	2.32	7.06	7	9.38	.....	18.70	17.90
6249	.....	.....	2.02	2	1.07	11.70	11	12.77	.....	11.59	11.00
6250	1.24	1	2.34	2	1.47	9.64	9	11.11	.....	16.29	14.40

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6253	Lazaretto Guano Co., Baltimore, Md.	Bone Compound.....	Ellicott City.....
6252	" " "	Grop Grower for Wheat and other Crops.	Ellicott City.....
6254	" " "	Dissolved S. C. Bone....	Ellicott City.....
6251	" " "	Forsythe & Linthicum's Mixture.	Ellicott City.....
6201	" " "	Pure Dissolved S. C. Bone.	Hagerstown.....
6306	" " "	Retriever Animal Bone Fertilizer.	Washington Grove.
6241	Lister's Agric'l Chem. Works, Newark, N. J.	Harvest Queen.....	Baltimore.....
6316	" " "	Lister's Stand. Pure Bone Super-Phos. of Lime.	New London.....
6222	" " "	Special Fertz. for Wheat.	Baltimore.....
6246	" " "	Standard Pure Bone Super-Phos. of Lime.	Baltimore.....
6436	T. H. Longfellow, Greensboro, Md.	Crop Grower.....	Greensboro.....
6437	" " "	Farmers' Delight No. 1.	Greensboro.....
6371	Maryland Fertz. Co., Baltimore, Md.	Bone Super-Phosphate..	Baltimore.....
6315	" " "	Dissolved Phosphate....	Baltimore.....
6446	" " "	Dissolved S. C. Bone ...	Smithsburg.....
6336	" " "	Globe Complete Manure.	Smithsburg.....
6335	" " "	Sangston's Cereal and Plant Food.	Smithsburg.....
6205	F. Mehrling, Bruceville, Md.	Acid Phosphate.....	Bruceville.....
6206	" " "	Dissolved Raw Bone....	Bruceville.....
6339	" " "	Emmert's Half - and - Half.	Williamsport.....
6207	" " "	General Crop Grower...	Bruceville.....
6204	" " "	Twenty-six-Dollar Phosphate.	Bruceville.....
6285	Miller Fertilizer Co., Baltimore, Md.	Buyers' Mixture.....	Monrovia.....

FERTILIZER ANALYSES.

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No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value Per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6253	1.46	1½	2.12	2½	1.50	10.35	10	11.85	.....	\$17.45	\$16.65
6252	2.03	2	2.22	2	1.92	9.29	10	11.21	.....	18.36	18.40
6254	.....	.....	.....	.....	2.00	14.60	14	16.60	.....	11.68	11.26
6251	2.63	2½	4.01	4	4.92	9.07	9	13.99	.....	22.94	21.55
6201	.....	.....	.....	.....	1.03	14.87	14	15.90	.....	11.89	11.20
6306	2.48	2½	3.69	4	4.00	10.17	9	14.17	.....	22.90	21.55
6241	1.97	1.50	1.65	2	3.27	8.58	9.50	11.85	.....	17.50	16.00
6516	4.49	2 85	2.03	2	2 37	10.08	10	12.45	12	26.52	21.35
6222	2.16	2	2.57	2	3.55	8.57	8	12.12	9.20	19.04	16.48
6246	3.02	2	1.68	1½	2 87	9.75	10	12.52	12	21.64	18.30
6486	.75	½	1.51	1½	1.22	8.92	8	10.14	.....	11.13	9.40
6437	1.31	1	2.59	2	2.00	9.07	8	11.07	.....	16.39	13.00
6371	.....	.....	2.01	2	1.10	11.46	10	12.56	11	11.39	10.20
6315	.....	.....	.....	.....	1.35	14.52	11	15.87	12	11.62	8.80
6446	.....	.....	.....	.....	1.20	15.07	14	16.27	.....	12.06	11.20
6336	2.20	2	2.26	1½	3.37	8.94	9	12.31	10	19.15	16.90
6335	1.40	1½	2.76	2½	3.50	9.16	10	12.66	11	17.52	16.40
6205	.....	.....	.....	.....	3.10	15.19	14	18.29	.....	12.15	11.20
6206	2.02	1½	.....	.....	1.93	16.43	14	18.36	.....	23.26	18.90
6339	1.08	1	.....	.....	2.70	16.38	14	19.08	.....	20.70	17.00
6207	1.25	¾	1.27	1	3.10	11.51	11	14.61	.....	17.77	12.05
6204	1.90	1½	1.24	1	3.45	13.31	12	16.76	.....	21.63	17.15
6285	3.87	3	2.82	2½	1.37	8.52	7	9.89	.....	23.50	18.50

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6209	Miller Fertilizer Co., Balti- more, Md.	Clinch Phosphate.....	Finksburg
6373	" " "	Dissolved Raw Bone....	Baltimore.....
6229	" " "	Dissolved S. C. Rock....	Baltimore.....
6237	" " "	Harvest Queen.....	Baltimore.....
6240	" " "	Hustler Phosphate.....	Baltimore.... .
6347	" " "	Standard Phosphate....	Baltimore.....
6208	" " "	W. G. Phosphate.....	Finksburg.....
6323	C. H. Miller, Loys, Md	Miller's Mixture.....	Loys.....
6322	" " "	Royal Wheat, Corn and Grass Mixture.	Loys.....
6428	Wm. McKenney, Centre ville, Md.	No. 1 D. Phosphate....	Centreville.
6429	" " "	McKenney's Compound.	Centreville.....
6431	" " "	Soluble No. 3 Phosphate	Centreville.....
6395	Geo. R. Mowell, Glencoe, Md.	Dissolved S. C. Rock...	Glencoe.....
6385	" " "	Standard Bone Phos....	Parkton.....
6750	Nickerson Fertz. Co., Eas- ton, Md.	Advance Guano.....	Denton.....
6732	" " "	Bone and Potash..	Cambridge.....
6730	" " "	Mixture.....	Cambridge.....
6511	" " "	S. C. and Potash.....	Borday.....
6733	" " "	S. C. Phosphate and Potash.	Cambridge.....
6651	G. Ober & Sons Co., Balti- more, Md.	Dissolved Animal Bone.	Locust Point.....
6584	" " "	Dissolved Bone Phos....	Baltimore.....
6683	" " "	Dissolved Bone Phos....	Baltimore.....
6731	" " "	Dissolved Bone Phos. and Potash.	Cambridge.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6209	2.21	1.00	2.04	1.50	1.02	7.86	7	8.88	.....	\$16.94	\$12.30
6373	2.72	2½	.....	.....	1.25	12.10	11	13.35	14	20.76	19.70
6229	.....	.....	.....	.....	1.78	14.86	14	16.74	.....	11.88	11.20
6237	1.50	1.25	2.51	2.25	.87	11.09	10	11.96	.....	18.45	16.60
6240	1.28	1	2.61	2.25	1.00	9.81	9	10.81	.....	16.66	14.65
6347	3.66	2.85	2.37	2¼	1.50	10.70	10	12.20	.....	24.55	21.40
6208	.71	.50	1.25	1.00	.92	7.59	7.00	8.51	.....	9.63	8.50
6323	1.96	2	2.87	2	4.22	7.75	5½	11.97	12	18.19	16.10
6322	1.40	1	2.41	1½	1.25	8.39	8	9.64	10	15.50	13.30
6428	2.77	2½	1.83	1½	3.15	8.42	8	11.57	.....	19.82	17.60
6429	2.12	1½	2.17	1½	2.90	10.24	10	13.14	.....	19.93	16.25
6431	.52	.30	2.16	3	1.45	12.90	12	14.35	.....	14.33	13.50
6395	.....	.....	.....	.....	1.47	15.38	14	16.85	.....	12.30	11.20
6385	1.79	2	2.51	2	1.97	11.37	10	13.34	11	20.23	18.40
6750	.57	½	2.19	1½	2.52	8.70	7	11.22	8	11.26	8.80
6732	.65	½	1.63	2	2.45	10.25	8	12.70	9	12.27	10.10
6730	.65	½	2.50	2	2.52	10.96	.....	13.48	8	13.70	9.30
6511	.....	.....	2.98	3	1.50	11.93	11	13.43	.....	12.83	11.80
6733	.....	.....	2.36	2	2.15	11.05	.....	13.20	11	11.63	10.20
6651	3.66	2¼	.....	.....	3.27	11.66	10	14.93	.....	23.94	18.30
6584	.....	.....	.....	.....	1.80	14.70	14	16.50	.....	11.76	11.20
6683	.....	.....	.....	.....	1.30	15.10	.....	16.40	14	12.08	11.20
6731	.....	.....	2.43	2	.72	11.88	11	12.60	... ..	12.07	11.30

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6648	G. Ober & Sons Co., Baltimore, Md.	Farmers' Mixture.....	Locust Point.....
6713	" " "	Farmers' Standard Ammonia Phos.	Baltimore.....
6658	" " "	Fish and Potash Fertz...	Jackson's Wharf....
6748	Pacific Guano Co., New York.	Fish and Potash.....	Ridgely.....
6626	Packer's Union Fertz. Co., New York.	Banner Wheat Grower...	Taneytown.....
6590	" " "	Universal Fertilizer.....	Baltimore.....
6702	Patapsco Guano Co., Baltimore, Md.	Balto. Soluble Phos.....	Baltimore.....
6678	" " "	Coon Brand Guano.....	Baltimore.....
6703	" " "	Pure Dissolved S. C. Bone.	Baltimore.....
6725	" " "	Sea Gull Guano.....	Snow Hill.....
6726	" " "	Special Wheat Com-pound.	Snow Hill.....
6677	Piedmont-Mt. Airy Guano Co., Baltimore, Md.	Caroline Mixture.....	Baltimore.....
6777	" " "	Caroline Mixture.....	Greensboro.....
6639	" " "	Dissolved S. C. Bone....	Light-Street Wharf.
6638	" " "	Insula Guano for Corn, Oats and other Crops.	Baltimore.....
6641	" " "	Levering's Excelsior...	Light-Street Wharf.
6699	" " "	Piedmont Pure Raw Bone Mixture.	Leslie.....
6718	" " "	Piedmont Dissolved Bone Phos. Potash Goods.	Secretary
6640	" " "	Pure Raw Bone Mixture..	Light-Street Wharf.
6642	" " "	Royal Ammoniated Bone and Potash.....	Light-Street Wharf.
6643	" " "	Soluble Bone and Potash for Grain and Grass...	Light-Street Wharf.
6563	O H. Pearre, Union Bridge, Md.	No. 1 Bone Phosphate...	Union Bridge.....
6564	" " "	Farmers' Choice.....	Union Bridge.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6648	1.37	1	2.15	2	1.62	10.79	9	12.41	.....	\$17.69	\$14.80
6713	2.03	2	2.31	2	1.52	11.28	9	12.80	.....	20.28	17.80
6658	2.31	2	2.51	2	2.52	9.51	9	12.03	.....	19.95	17.80
6748	2.47	2	2.75	2	4.07	8.58	8	12.65	.....	20.72	16.00
6626	.....	.....	1.05	$\frac{1}{2}$	1.13	10.43	10	11.56	.....	9.64	8.70
6590	1.20	1	5.19	5	1.71	9.25	9	10.96	.....	18.72	17.40
6702	.....	.....	2.01	2	1.42	11.34	11	12.76	.....	11.36	11.00
6678	1.19	1	2.71	3	1.50	9.60	9	11.10	.. ....	16.48	15.40
6703	.....	.....	.....	.....	1.37	13.93	14	15.30	.....	11.14	11.20
6725	1.17	1	2.51	1	2.82	8.44	8	11.26	.....	15.58	12.40
6726	2.15	2 $\frac{1}{2}$	2.97	2 $\frac{1}{2}$	4.67	9.53	9	14.20	.....	20.81	20.25
6677	1.22	1	2.25	2	1.25	8.15	8	9.40	9	14.56	13.40
6777	1.06	1	2.44	2	1.20	8.08	8	9.28	9	14.18	13.40
6639	.....	.....	.....	.....	.74	14.17	14	14.91	16	11.33	11.20
6638	.51	$\frac{1}{2}$	2.42	2	1.97	6.87	5	8.84	7	9.83	7.90
6641	1.03	1	1.25	1	1.27	8.73	8	10.00	10	13.57	12.80
6699	1.47	1	1.81	1	2.65	7.86	7	10.51	11	15.14	12.60
6718	.....	.....	1.19	1	1.37	10.80	10 $\frac{1}{2}$	12.17	11 $\frac{1}{2}$	10.10	9.60
6640	1.33	1	1.10	1	3.15	8.23	7	11.38	11	14.78	12.60
6642	1.42	1.30	3.24	3	2.15	9.40	6	11.55	8	17.76	13.70
6643	.....	.....	2.17	2	1.67	8.28	8	9.95	10	9.12	8.80
6563	1.61	1 $\frac{1}{2}$	2.09	1 $\frac{1}{2}$	2.80	7.51	7	10.31	.....	15.55	13.25
6564	1.01	.875	1.27	1.125	1.75	9.15	8 $\frac{1}{2}$	10.90	.....	14.15	10.33

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6565	O. H. Pearre, Union Bridge, Md.	Union Bridge Favorite...	Union Bridge.....
6598	R. H. Pollock, Baltimore, Md.	Ammoniated Bone Phosphate.	Ellicott City.....
6618	" " " "	Dissolved S. C. Bone...	Walkersville.....
6617	" " " "	Owl Brand Guano.....	Walkersville.....
6594	" " " "	Special Wheat Grower...	Ellicott City.....
6557	Ramsburg Fertz. Co., Frederick, Md.	Ammoniated Bone Phosphate.	Frederick.....
6614	" " " "	Alkaline Phosphate.....	Monrovia.....
6549	" " " "	Dissolved Bone Super-Phosphate.	Reid.....
6530	" " " "	Excelsior Plant Food....	Fountain Mills....
6556	" " " "	Old Virginia Compound..	Frederick
6735	Rasin Monumental Co., Baltimore, Md.	Ammoniated Super-Phosphate.	Chestertown.....
6632	" " " "	Arundel Complete.....	Washington Grove.
6629	" " " "	Bone and Potash Fertz...	Taneytown.....
6621	" " " "	Dissolved Bone	Woodsboro.....
6578	" " " "	Empire Guano.....	Baltimore.....
6619	" " " "	I X L Fertilizer.....	Walkersville.....
6753	" " " "	Monumental Acid Phosphate.	Federalsburg.....
6577	" " " "	Rasin Acid Phosphate....	Baltimore.....
6630	" " " "	Wm. Penn Crop Grower.	Taneytown.....
6652	Henry Reckord Mfg. Co., Belair, Md.	Animal Bone Phosphate..	B. and L.
6654	" " " "	Dissolved S. C. Bone....	B. and L.
6694	" " " "	Special Compound.....	Belair.....
6653	" " " "	Special Compound.....	B. and L.

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.								Comparative Value per Ton Guaranteed.
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.		Comparative Value per Ton Found.			
						Found.	Guaranteed.	Found.	Guaranteed.				
6565	1.31	1	2.06	1½	2.15	8.11	8	10.26	.....	\$14.96	\$12.75		
6593	2.01	2	2.21	2	1.99	10.26	10	12.25	11	19.29	18.40		
6618	.....	.....	.....	.....	2.05	14.05	14	16.10	.....	11.24	11.20		
6617	0.62	½	2.01	1½	1.48	7.84	7	9.32	8	10.44	8.80		
6594	1.10	1	1.91	2	1.85	9.69	9	11.54	10	15.64	14.40		
6557	1.16	1	1.67	2	3.80	10.47	10	14.27	12	17.14	15.40		
6614	.....	.....	2.07	2	5.87	10.44	10	16.31	12	11.59	10.20		
6549	.....	.....	.....	.....	2.10	14.27	14	16.37	16	11.42	11.20		
6530	2.47	2.25	1.83	2	3.38	10.82	9	14.20	12	21.41	18.55		
6556	2.30	1½	2.35	2	2.07	10.25	9	12.32	.....	20.32	16.30		
6735	1.18	1	1.58	1	2.17	7.93	8	10.10	.....	13.91	12.40		
6632	1.84	2	2.48	2	2.97	8.83	8	11.80	.....	18.01	16.60		
6629	.....	.....	1.95	1½	2.27	11.23	12	13.50	.....	11.30	11.05		
6621	2.59	2	.....	.....	2.40	10.01	10	12.41	.....	18.74	16.60		
6578	1.96	2½	2.08	1½	2.37	8.92	8	11.29	.....	17.82	17.60		
6619	1.31	1	3.34	3	1.80	9.09	9	10.89	.....	17.08	15.40		
6753	.....	.....	.....	.....	.82	15.79	14	16.61	.....	12.63	11.20		
6577	.....	.....	.....	.....	1.45	14.01	14	15.46	.....	11.21	11.20		
6630	1.18	1	1.16	1	2.52	9.51	8	12.03	.....	15.11	12.40		
6652	1.04	1½	2.02	2	2.77	10.05	9	12.82	.....	16.29	15.50		
6654	.....	.....	.....	.....	1.65	13.31	14	14.96	.....	10.64	11.20		
6694	2.14	2.03	2.13	2.13	1.80	10.58	10.66	12.38	13.16	19.85	19.88		
6653	2.00	2.03	2.41	2.13	1.82	10.22	10.66	12.04	12.13	19.34	19.46		

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6625	Reindollar & Co., Taneytown, Md.	Ammoniated Bone Phosphate.	Taneytown.....
6579	" " "	Reindollar & Co's Fish Phosphate.	Baltimore.....
6566	W. G. Rhinehart & Co., Union Bridge, Md.	No. 2 Bone Phosphate....	Union Bridge.....
6567	" " "	No. 3 Bone Phosphate...	Union Bridge.....
6524	Isaac Robinson, Baltimore, Md.	High - Grade Soluble Phosphate.	Pykesville.....
6588	" " "	Pennsylvania Special....	Baltimore.....
6696	" " "	Special Wheat and Grass Phosphate.	Baltimore.....
6637	" " "	Standard Dissolved Bone Phosphate.	Light St. Wharf..
6523	" " "	Tankage.....	Pykesville.....
6534	Scott Fertz. Co., Elkton, Md.	Acid Phosphate and Potash.	Crumpton.....
6532	" " "	Bone and Potash.	Crumpton.....
6709	" " "	Elk Head Super-Phosphate.	Rising Sun.....
6711	" " "	Standard Phosphate....	Elkton.....
6707	" " "	Sure Growth Super-Phosphate.	Rising Sun.....
6531	" " "	Tankage.....	Crumpton.....
6708	" " "	Tip-Top Soluble Bone...	Rising Sun.....
6574	Chas. Shaffer, Westminster, Md.	Big Gun.....	Westminster.....
6570	" " "	Governor.....	Westminster.....
6572	" " "	H. G Acid Phos. or Dissolved S. C. Rock.....	Westminster.....
6571	" " "	Leader.....	Westminster.....
6573	" " "	Pride... ..	Westminster.....
6569	" " "	Super A.	Westminster.....
6675	J. D. Simmons, Hagerstown, Md.	Wheat and Clover Producer.	Hagerstown.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value Per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6625	1.03	$\frac{1}{2}$	1.85	1	1.17	8.36	7	9.53	.....	\$13.76	\$ 8.10
6579	2.68	2	2.20	2	2.22	8.97	8	11.19	.....	20.09	16.00
6566	2.54	1.55	2.68	2.50	2.57	9.03	8.27	11.60	.....	20.35	15.42
6567	1.39	.75	1.99	3.21	1.90	10.58	8.09	12.48	.....	17.50	11.93
6524	.....	.....	.....	.....	1.80	14.20	14	16.00	.....	11.36	11.20
6588	2.04	2	5.28	5	1.65	8.22	7	9.87	.....	20.28	18.40
6696	2.27	2	3.10	2	1.42	9.07	8 $\frac{1}{2}$	10.49	11	19.55	17.90
6637	1.14	1	2.01	2	2.06	10.87	10	12.93	11 $\frac{1}{2}$	17.34	15.60
6523	10.88	10	.....	.....	.....	.....	.....	4.57	.....	28.86	24.00
6534	.....	.....	2.76	3	1.38	12.74	14	14.12	.....	13.22	14.20
6532	.....	.....	4.79	5	1.70	12.53	14	14.23	.....	15.40	16.20
6709	1.60	1	2.15	1	3.40	10.00	9	13.40	.....	18.31	18.40
6711	1.70	1 $\frac{1}{2}$	2.01	2	2.50	10.40	8	12.90	.....	18.51	14.50
6707	1.94	2	1.92	2	1.42	11.31	10	12.73	.....	19.62	18.00
6531	9.10	9	.....	.....	.....	.....	.....	8.50	.....	26.94	21.60
6708	.....	.....	.....	.....	1.27	14.63	14	15.90	.....	11.70	11.20
6574	2.03	2	2.01	2	.55	11.72	10	12.27	.....	20.04	18.00
6570	1.50	1 $\frac{1}{2}$	2.38	2 $\frac{1}{2}$	.75	11.22	9	11.97	.....	18.40	16.00
6572	.....	.....	.....	.....	1.80	14.83	14	16.63	.....	11.86	11.20
6571	1.01	1	1.64	1 $\frac{1}{2}$	.87	10.98	8	11.85	.....	15.99	12.50
6573	2.97	2 $\frac{1}{2}$	2.08	2	.82	11.71	11	12.53	.....	23.02	21.30
6569	.98	$\frac{3}{4}$	1.27	1	.97	9.05	7 $\frac{1}{2}$	10.02	.....	11.64	9.45
6575	2.21	2	5.92	6	1.12	10.79	12	11.91	.....	23.78	24.00

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6508	W. T. Simpson, Milford, Del.	No. 1.....	Greensboro.....
6602	Slingluff & Co., Baltimore, Md.	Bone and Potash....	Woodbine.....
6601	" " "	British Mixture.....	Woodbine.....
6679	" " "	Dissolved S. C. Bone....	Baltimore.....
6505	Southern Fertilizer Co., York, Pa.	Ammoniated Dissolved Bone.	Avery.....
6576	" " "	Ammoniated Dissolved Bone.	Baltimore.....
6510	" " "	Bone and Potash.....	Mt. Airy
6589	" " "	Dissolved Bone Phosphate.	Baltimore.....
6633	" " "	Dissolved Bones.....	Washington Grove.
6634	" " "	Export Bone with Potash.	Washington Grove.
6661	" " "	General Crop Grower...	Laurel.
6550	" " "	Ox Brand Bone Fertilizer.	Keysville.....
6635	" " "	Royal Wheat and Grass Grower.	Rockville
6695	Standard Fertilizer Co., Boston, Mass.	Standard Bone and Potash.	Baltimore.....
6562	G. W. Stocksdale, Thurmont, Md.	Ammoniated Bone Super-Phosphate	Thurmont.....
6674	J. W. Stonebraker & Son, Hagerstown, Md.	Dissolved Ammoniated Bone.	Hagerstown.....
6673	" " "	Dissolved Bone Phosphate.	Hagerstown.....
6671	" " "	South Carolina.....	Hagerstown.....
6670	" " "	Special.....	Hagerstown.....
6666	Joseph A. Stouffer, New Windsor.	Butcher-House Phosphate.	New Windsor.....
6665	" " "	Soluble Wheat Grower..	New Windsor.....
6575	Wm. H. Street & Co., Baltimore, Md.	Ammoniated Dissolved Bone.	Baltimore.....
6690	" " "	Special Phosphate.....	Baltimore.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value Per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6508	1.82	1	1.29	1	3.17	11.53	6	14.70	6	\$19.55	\$10.00
6602	.....	.....	2.70	2½	2.50	13.31	13	15.81	.....	13.84	12.90
6601	2.52	2½	2.74	2½	2.02	9.77	8	11.79	.....	20.87	18 00
6679	.....	.....	.....	.....	.86	15.22	14	16.08	.....	12.17	11.20
6505	2.15	2	2.51	2½	1.52	10.71	10	12.23	.....	20.27	18.50
6576	2.18	2	2.46	2½	1.72	14.66	16	16.38	.....	24.34	18.50
6510	.....	.....	2.81	3	.80	12. 9	12	13.39	.....	13.04	12.60
6589	.....	.....	.....	.....	1.03	14. 2	14	15.25	.....	11.37	11.20
6633	2.06	2	.....	.....	1.97	10.02	10	11 99	.....	16.98	16.00
6634	1.76	2	2.37	2	7 20	8.75	.....	15.95	.....	16.68	8.00
6661	.79	½	2.18	2	1.75	8.38	8	10.13	.....	11.60	9.90
6550	.....	.....	.....	.....	2 32	13.87	14	16.19	.....	11.10	11.20
6635	.82	1½	1.50	1	1.80	8.90	8	10.70	.....	11.44	13.50
6695	.....	.....	1.83	2½	1.80	10.18	8	11.99	10	10.34	9.30
6562	1.05	1	2.29	2½	2.12	10.04	9	12.16	.....	16.32	14.25
6674	2.64	2½	.....	.....	.75	12.30	12	13.05	.....	20.52	19.50
6673	2.09	2	2.59	2	2.07	11.14	10	13.21	.....	20.82	18.00
6671	.....	.....	.....	.....	1.22	14.56	14	15.78	.....	11.64	11.20
6670	2.46	2½	4.57	4	5.17	9.23	9	14.40	.....	23.57	22 30
6666	1.45	¾	5.36	2½	1.72	11.41	8	1. 13	9	21.81	11.35
6665	.75	¼	3.03	2½	1.90	8.85	7½	10.75	8½	12.74	9.65
6575	1.64	1½	2.10	2	.97	9.75	9	10.72	.....	17.15	16.3
6690	.75	½	1.17	1	.72	7.46	7	8.18	.....	9.52	8.30

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6612	J. W. Sullivan, Monrovia, Md	Bone and Potash Mixture.	Monrovia.....
6610	" " "	Sullivan's Sure Success Pure Am. Bone Su. Phos.	Monrovia
6738	Susquehanna Fertilizer Co., Baltimore, Md.	Ammoniated Bone Phos.	Chestertown.....
6656	" " "	Ammoniated Bone Phos.	B. and L.....
6606	" " "	Superior Rock Phos.....	Mt Airy.....
6714	" " "	Soluble Bone and Potash.	Baltimore.....
6739	" " "	XXV Phosphate.	Chestertown.....
6592	Talbott & Clark, Ellicott City.	Ammoniated Bone Phos- phate.	Ellicott City.....
6591	" " "	Grain and Grass Grower.	Ellicott City.....
6553	D. A. Thomas, Hagers- town, Md.	Bone Mixture.....	Hagerstown.....
6552	" " "	Dissolved Bone	Hagerstown.....
6554	" " "	Farmers' Mixture.....	Hagerstown.....
6676	J. P. Thomas & Sons Co., Philadelphia, Pa.	S. C. Phosphate....	Hancock
6727	The W. B. Tilghman Co., Salisbury, Md.	Bone Tankage Mixture for Wheat and Grass.	Salisbury.....
6728	" " "	Fish Mixture.....	Salisbury.....
6729	" " "	Mixture "Bee."	Salisbury.....
6559	J. Tyson & Son, Frederick, Md.	Ammoniated Super-Phos- phate of Lime.	Frederick.....
6560	" " "	Half & Half Super-Phos- phate.....	Frederick.....
6561	" " "	Special Mixture..	Frederick.....
6605	Virginia-Carolina Chemi- cal Co., Richmond, Va.	Special Formula.....	Mt. Airy
6622	" " "	Ammoniated Super-Phos phate.....	Woodsboro.....
6604	" " "	Dissolved Bones.....	Mt. Airy.....
6599	" " "	Guaranteed 14 Per Cent. Acid Phosphate.	Morgan.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.				Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.	
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.			
						Found.	Guaranteed.	Found.			Guaranteed.
6612	.....	.....	2.66	2½	1.97	14.21	13	16.18	.....	\$14.11	\$12.90
6610	2.22	2	2.14	2	2.00	11.27	10	13.27	.....	20.87	18.00
6738	2.10	2	2.53	2	3.40	9.20	9	12.66	.....	19.39	17.80
6656	2.23	2	2.38	2	4.19	9.01	9	13.20	.....	19.75	17.80
6606	.....	.....	.....	.....	1.87	16.13	14	18.00	.....	12.90	11.20
6714	.....	.....	2.52	2	1.58	10.28	10	11.86	.....	11.05	10.40
6739	1.30	1½	1.52	1	2.65	8.91	8	11.56	.....	15.39	13.55
6592	1.26	1	2.17	2	2.17	8.08	8	10.25	10	14.89	13.80
6591	2.15	2	3.21	3	3.52	9.46	9	12.96	10	20.52	18.40
6553	2.40	2	2.77	2	2.67	10.39	10	13.06	.....	21.42	18.00
6552	3.89	3	.....	.....	5.67	13.71	11	19.38	15	27.64	21.60
6554	1.66	1½	1.86	1½	2.07	9.15	8	11.22	.....	16.81	14.00
6676	.....	.....	.....	.....	1.30	14.88	14	16.18	16	11.90	11.20
6727	2.48	2½	1.93	2	3.17	9.36	8	12.53	10	19.99	18.30
6728	2.40	3	2.03	2	2.25	9.70	7	11.95	.....	20.03	18.00
6729	4.13	4	3.29	3	1.80	8.39	8	10.19	.....	24.79	23.00
6559	1.38	1¾	1.72	2	2.27	11.65	10	13.92	.....	18.41	17.25
6560	.84	½	1.99	1	1.32	12.78	8	14.10	.....	14.99	8.90
6561	1.01	1	1.28	1	1.75	9.21	8	10.96	.....	14.22	12.00
6605	1.00	½	1.30	1	3.30	8.03	8	11.33	.....	13.65	8.90
6622	1.02	1	1.70	2	3.07	9.33	9	12.40	.....	15.37	14.00
6604	2.51	2	.....	.....	1.74	10.73	10	12.47	.....	18.96	16.00
6599	.....	.....	.....	.....	1.60	14.12	14	15.72	.....	11.29	11.20

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6509	Virginia-Carolina Chemical Co., Richmond, Va	High Grade Ammoniated Fertilizer.	Woodville.....
6623	" " "	High Grade Ammoniated Fertilizer.	Woodsboro.....
6526	" " "	Rock and Potash.....	Mt. Airy.....
6616	" " "	Special Compound for Wheat.	Harmony Grove....
6603	" " "	Special Formula.....	Mt. Airy.....
6598	" " "	Standard Bone and Potash.	Morgan.....
6597	W. H. Warfield, Sykesville, Md.	Wheat and Grass Mixture.	Sykesville.....
6722	S. L. Webster & Son, Cambridge, Md.	No. 2 Ammoniated Bone Phosphate.	Cambridge.....
6721	" " "	S. C. Bone.....	Cambridge.....
6723	" " "	Poudrette Mixture.....	Cambridge.....
6724	" " "	The Times Brand Bone Phosphate.	Cambridge.....
6609	M. E. Wheeler & Co., Rutland, Vt.	High Grade Royal Wheat Grower.	Monrovia.....
6681	Williams & Clark, New York.	Acorn Brand Acid Phosphate.	Baltimore.....
6745	" " "	Fish and Potash.....	Ridgely.....
6747	" " "	Ground Tankage.....	Ridgely.....
6737	" " "	Nicholson Formula.....	Chestertown.....
6761	" " "	Rock and Potash.....	Ridgely.....
6762	" " "	S. C. Rock or Acorn Brand Acid Phos.	Ridgely.....
6645	The Robt. A. Wooldridge Co., Baltimore, Md.	Chieftain Bone Stock Phosphate.	Smith's Wharf....
6684	" " "	Liberty Bell Potash Mixture.	Baltimore.....
6685	" " "	Little Giant Phosphate..	Baltimore.....
6689	" " "	Old Sledge Phosphate..	Baltimore.....
6716	The Zell Guano Co., Baltimore, Md.	Ammoniated Bone Super Phosphate.	Baltimore.....

No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.						Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.				
						Found.	Guaranteed.	Found.	Guaranteed.			
6509	2.86	2	1.81	2	3.14	8.63	10	11.77	.....	\$20.27	\$18.00	
6623	2.08	2	2.01	2	1.63	10.25	10	11.88	.....	19.15	18.00	
6526	.....	.....	1.91	3	1.52	10.88	13	12.40	.....	10.96	13.24	
6616	1.15	1	2.34	1	2.04	8.82	8	10.86	.....	15.41	12.40	
6603	1.84	$\frac{1}{2}$	1.01	1	2.07	9.43	8	11.50	.....	16.78	9.14	
6598	.....	.....	2.02	2	2.65	11.83	10	14.48	.....	12.01	10.20	
6597	1.16	1	1.70	1.60	2.87	8.07	8	10.94	.....	14.39	13.00	
6722	2.56	2.40 $\frac{1}{2}$	2.70	2	.88	8.07	8	8.95	.....	18.80	17.21	
6721	.....	.....	.....	.....	1.21	13.46	.....	14.67	14	10.77	10.32	
6723	.80	$\frac{1}{2}$	3.39	3.06	.82	6.69	6.16	7.51	7.28	11.30	9.70	
6724	.61	59	3.04	2 $\frac{1}{2}$	.65	8.38	9	9.03	.....	11.60	11.47	
6609	1.14	1	2.20	2	2.30	9.52	8	11.82	.....	16.06	13.40	
6681	.....	.....	.....	.....	.77	14.86	14.17	15.63	15	11.88	11.20	
6745	2.34	2	2.37	2	4.45	8.98	8	13.43	.....	20.32	16.00	
6747	10.64	10	.....	.....	.....	.....	.....	5.33	.....	28.45	24.00	
6737	2.10	2	3.37	3	3.65	9.45	9	13.10	.....	20.58	18.00	
6761	.....	.....	5.02	5	1.27	12.93	12	14.20	.....	15.62	14.60	
6762	.....	.....	.....	.....	2.77	15.38	14	18.15	.....	12.30	11.20	
6645	2.04	2	2.31	2	2.25	9.15	9	11.40	.....	18.48	17.40	
6684	.....	.....	1.87	2	.72	11.46	11	12.18	12	11.14	11.00	
6685	1.10	1	2.05	2	1.92	9.79	9	11.71	.....	15.90	14.40	
6689	1.12	1	1.02	1	2.01	8.35	8	10.36	.....	13.53	12.40	
6716	2.20	2	2.34	2	2.90	8.67	8	11.57	10	18.77	16.80	

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6581	The Zell Gnano Co., Bal-	Calvert Guano	Baltimore
6586	timore, Md. " "	Dissolved Bone Phos-	Baltimore.....
6611	" " " "	phate. Dissolved Bone Phos-	Monrovia.....
6705	" " " "	phate and Potash. Dissolved S. C. Phos-	Baltimore.....
6704	" " " "	phate. Economizer.....	Baltimore.....
6600	" " " "	Little Giant, a Complete Fertilizer.	Woodbine.....

FERTILIZER ANALYSES.

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No.	NITROGEN Calculated as AMMONIA.		POTASH, K ₂ O.		PHOSPHORIC ACID.						Comparative Value per Ton Found.	Comparative Value per Ton Guaranteed.
	Found.	Guaranteed.	Found.	Guaranteed.	Insoluble Found.	Available.		Total.				
						Found.	Guaranteed.	Found.	Guaranteed.			
6581	.98	$\frac{3}{4}$	1.84	1 $\frac{1}{4}$	1.40	11.67	9	13.07	11	\$14.39	\$11.85	
6586	.....	.....	.....	.....	1.02	15.64	14	16.66	16	12.51	11.20	
6611	.....	.....	1.27	1	3.17	12.45	12	15.62	14	11.97	11.00	
6705	.....	.....	.....	.....	2.27	14.66	13	16.93	15	11.72	10.40	
6704	1.33	1	1.46	1	2.65	10.23	9	12.88	11	16.74	13.80	
6600	1.59	1	1.40	1	1.22	10.76	8	11.96	10	17.41	12.80	

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6341	Alexandria Fertz. & Chem- ical Co., Alexandria Va.	Pure Raw Bone Meal...	Hancock.....
6301	Baugh & Sons Co., Balti- more, Md.	Bone Meal Warranted Pure.	Pleasant Hill.....
6372	The Berg Co., Philadel- phia, Pa.	Raw Bone, Fine.....	Baltimore.....
6318	Chas. E. Bond. Spencer ville Md.	Pure Ground Bone... ..	Spencerville
6309	Chemical Co.. of Canton Baltimore, Md.	Baker's Stand. Ground Bone.....	Baltimore.....
6438	Clark's Cove Fertz. Co., New York.	White Oak Pure Ground Bone.	Denton.....
6403	Eureka Fertz. Co., Perry- ville, Md.	Bone Meal.....	Rising Sun.....
6353	Griffith & Boyd, Baltimore, Md.	Pure Fine Ground Bone Dust.	Baltimore.....
6392	" " "	Soft Ground Bone.....	Corbett.....
6327	Hanover Bone Fertz. Co. Hanover, Pa.	Hanover Pure Bone Meal	Westminster.
6226	Joshua Horner, Jr., & Co. Baltimore, Md.	Slaughter-House Bone Dust.	Baltimore.....
6342	Lazaretto Guano Co., Bal- timore, Md.	Harford Bone.....	Ellicott City
6338	Jos. Lister, Chicago, Ill....	Pure Bone Meal.....	Chewsville.....
6262	Lister's Agr'l Chemical Works, Newark, N. J.	Pure Raw Bone Meal...	Sykesville.....
6258	Miller Fertilizer Co., Bal- timore, Md.	Ground Bone.....	Ellicott City.....
6582	Henry Reckord Mnf'g Co., Belair, Md.	Raw Bone.....	Baltimore.....
6691	" " "	Raw Bone.....	Belair.....
6587	Isaac Robinson, Baltimore, Md.	Pure Raw Bone.....	Baltimore.....
6710	Scott Fertz. Co., Elkton. Md.	Pure Ground Bone.....	Elkton.....
6636	Southern Fertz. Co., York. Pa.	Fine Raw Bone.....	Rockville
6672	J. W. Stonebraker & Son, Hagerstown, Md.	Bone Meal.....	Hagerstown.....
6687	Wm. H. Street, & Co., Baltimore, Md.	Ground Bone.....	Baltimore.....
6668	The Taylor Provision Co., Trenton, N. J.	Pure Ground Bone.....	Keedysville..

No.	Mechanical Analysis.				NITROGEN. Calculated as AMMONIA.		TOTAL PHOSPHORIC ACID.		Comparative Value Found.
	Fine.	Fine Medium.	Medium.	Coarse.	Found.	Guaranteed.	Found.	Guaranteed.	
6341	44	38	18	00	4.52	4	.62	21½	\$29.77
6501	51	35	14	00	4.66	4	22.03	21½	31.18
6372	65	25	10	00	4.41	5	20.89	22	30.56
6318	30	30	36	4	5.33	4½	21.05	20	28.57
6309	64	17	14	5	4.04	4	15.26	18	23.65
6438	63	23	15	00	2.83	3	20.98	20	26.17
6403	70	20	10	00	2.59	3	24.88	25	29.77
6353	53	25	22	00	4.39	4	17.89	21½	26.51
6392	72	16	12	00	3.06	3	12.22	11	19.31
6327	46	23	31	00	6.44	4	11.91	23	25.72
6226	40	31	29	00	7.22	6	19.54	20	34.47
6342	58	18	14	10	2.97	3	13.99	.....	19.22
6338	47	29	24	0	3.73	4 68	25.07	25.60	30.56
6262	43	28	23	6	3.57	3	24.94	23	28.99
6258	44	20	21	15	3.77	4	21.19	.....	25.57
6582	53	21	16	10	4.37	5.29	20.10	20.38	27.53
6691	33	26	27	14	5.17	5.23	18.49	20.38	25.05
6587	35	30	35	00	4.75	4	23.98	.....	30.54
6710	43	21	26	10	4.64	4	22.29	.....	28.75
6636	29	21	25	25	4.64	4½	22.25	.....	25.98
6672	55	33	12	00	5.24	4½	20.10	.....	31.28
6687	43	20	22	15	3.97	4	20.88	.....	25.79
6668	74	20	6	00	3.43	3	22.55	.....	30.25

No.	Name and Address of Manufacturer.	Name of Fertilizer.	Place of Sampling.
6631	R. B. Tenney, Georgetown D. C.	Pure Ground Bone Meal.	Gaithersburg.....
6551	D. A. Thomas, Hagers town, Md.	Fine Raw Bone.....	Hagerstown.....
6746	Williams & Clark, New York.	Pure Bone Meal.....	Ridgely.....
6646	Robert A. Wooldridge Co. Baltimore. Md.	Tuckahoe Bone Meal....	Baltimore.....

No.	Mechanical Analysis.				NITROGEN Calculated as Ammonia.		TOTAL PHOSPHORIC ACID.		Comparative Value Found.
	Fine.	Fine Medium	Medium.	Coarse.	Found.	Guaranteed.	Found.	Guaranteed.	
6631	43	23	23	11	4.35	4½	21.00	19	\$27.09
6551	50	37	13	00	4.82	4	22.84	.....	32.21
6746	51	27	22	00	4.40	3	20.56	20	28.69
6646	55	19	15	11	3.40	3	15.81	.....	21.61

COMMERCIAL FERTILIZERS.

Prior to 1860 the amount of commercial fertilizers manufactured in the United States was comparatively small. In the thirty years from 1860 to 1890 the amount per year had multiplied over fifty times. This is shown by statistics of fertilizers in the census reports as follows:

	1860.	1870.	1880.	1890.
Establishments.....	47	126	364	390
Hands Employed.....	308	2,501	8,598	10,158
Capital.....	\$466,000	\$4,395,948	\$17,913,660	\$40,594,168
Wages.....	95,016	766,712	2,648,422	4,671,831
Materials.....	590,816	3,808,025	15,595,078	25,113,874
Products.....	891,344	5,815,118	23,650,795	39,180,844

The value of fertilizers in those States, which manufactured more than \$500,000 worth, was as follows:

	1870.	1880.	1890.
MARYLAND.....	\$ 632,352	\$5,770,198	\$6,208,025
Georgia.....			5,026,034
South Carolina.....		2,691,053	4,417,658
New Jersey.....	661,659	2,423,805	4,319,088
New York.....		3,150,312	3,498,291
Pennsylvania.....	1,635,204	1,433,245	2,957,316
Virginia.....		624,300	2,475,638
Massachusetts.....	647,700	2,164,680	1,910,920
Ohio.....		531,540	1,287,101
Delaware.....		675,250	1,018,438
North Carolina.....			994,135
Illinois.....		729,400	924,758
Alabama.....			765,000
Michigan.....			753,585

GENERAL CONSIDERATIONS.

There is a well-established law that matter is neither created nor destroyed; it may undergo numerous transformations, combinations and decompositions, gases may combine forming solids, liquids or new gases; a gas may combine with a solid and the resulting compound be an invisible gas which passes off into the air, as is the case when charcoal burns. The amount, or mass or weight of the substances, however, is always the same.

Nearly all matter around us is complex and made up of simpler forms of matter. These simple forms of matter are called elements. Examples of elements are iron, copper, lead and sulphur. They cannot be decomposed into two or more forms of matter. Water is a compound; by means of an electric current it can be decomposed into two colorless gases—oxygen and hydrogen. There are at least seventy elements recognized by chemists, but only about a dozen of them make up the great bulk—over 99 per cent.—of everything around us.

Chemists frequently represent these elements by symbols, which are generally the initial letters of the names of the element, or by the initial letter followed by a small letter, as H for hydrogen, S for sulphur, Si for silicon. When the elements unite to form compounds, the compounds is represented by writing the symbols of the elements composing it together, thus: H_2O is the formula for water and means a compound composed of hydrogen and oxygen; the small 2 after the H meaning two chemical equivalents of hydrogen, the full meaning of which cannot be explained within the limits of this article.

Our ordinary plants grow partly in the earth and partly in the air and draw their nutriment from both, but get the larger portion from the air.

COMPOSITION OF PLANTS

Although plants usually contain nearly the same elements, they vary greatly as regards the proportions of those elements.

Grass, as cut for hay, contains about 75 per cent. of water. By air drying this is reduced to 10 or 15 per cent. By burning nearly all of the dry matter will go off into air, leaving about 6 per cent. of ash or mineral matter. The composition of such a substance is shown below.

Volatile Portion.	{	Water, (Hydrogen and Oxygen).	
		Carbon, (forms about half of the dry matter).	
		Oxygen,	{ (combined with the carbon and nitrogen).
		Hydrogen.	
		NITROGEN.	
Ash, or Mineral Portion.	{	POTASH, K_2O , ...	36.21 Per Cent.
		PHOS. ACID, P_2O_5 , ...	9.83
		Silica, SiO_2 , (sand)	16.76
		Lime, CaO , ...	11.97
		Clorin, Cl , ...	12.70
		Magnesia, MgO , ...	5.78
		Soda, Na_2O , ...	3.35
		Sulfur Trioxide, SO_3 , ...	3.55
		Manganese Trioxide, MnO_3 , ...	1.03
		Alumina, Al_2O_3 , ...	.58
*	{	Ferric Oxide, Fe_2O_3 , ...	.30
		Carbon Dioxide, CO_2 , 1.03 (is formed by burning carbon).	

*Analysis of hay ash by J. K. Haywood. (Chem. Bul. 56, U. S. Dept of Agriculture, p. 57), a trace of unburned carbon is omitted.

The source of the volatile portion of the plant is either directly or indirectly, the air. The source of the mineral portion is the soil.

Carbon occurs in the elementary form in nature as diamond and graphite or plumbago; we get it in the artificial products—charcoal, coke, lampblack, etc. When substances containing it burn or decay it combines with the oxygen of the air, forming an invisible gas, which is always present in the air. Plants take up this gas through their leaves and give off oxygen, thus storing up carbon in the plant.

Oxygen is an invisible gas, which forms one-fifth of the air. It is this gas that combines with substances when they burn. Plants take it up principally in water, which is eight-ninths oxygen. It forms nearly one-half of the solid crust of the earth, most substances of the earth being in combination with it. Its chemical symbol is O. (See ash analysis above.)

Hydrogen (H) is an invisible gas, the lightest substance known. It forms one-ninth of water.

Nitrogen is found uncombined in the air, of which it forms four-fifths. It does not readily combine with other things. Beans, peas and clover have the power of getting their supply of nitrogen from the air, and have long been used as soil-improvers on this account. Other plants must have nitrogen which is already in some form of combination. Hence it is one of the elements which must be frequently supplied in fertilizers in some form of combination.

Potash is the metal potassium combined with oxygen. This is a chemical curiosity, and is not used in its pure form as a fertilizer, but always in chemical combination. It is present in the rocks, which, by disintegrating, form the soil from which it is given up but slowly, being, as there combined, nearly insoluble in water. It is often necessary to supply it in fertilizers. When applied artificially it should be in a form completely soluble in water, which is the only solvent used to extract it when fertilizers are analyzed in the regular way.

Phosphoric Acid is the element phosphorus combined with

oxygen. In the soil and also in fertilizers it is always in combination with other substances; in fertilizers this is usually lime. The amount of lime with which it is combined determines its solubility. When soluble in water it is called *soluble phosphoric acid*; when not soluble in water, but soluble in a solution of citrate of ammonia, a solution which is intended to represent the juices of the plant, it is called *reverted*, or *precipitated phosphoric acid*. The sum of the *soluble* and the *reverted* is the *available phosphoric acid*. *Insoluble phosphoric acid* is that which is neither *soluble* nor *reverted*. It is not *available*, and requires an acid to dissolve it. The *total phosphoric acid* is the sum of the *soluble*, *reverted* and *insoluble*, or, to state it another way, it is the sum of the *available* and the *insoluble*.

Lime, or oxide of calcium, is the ordinary quick lime. In the plant and soil it is present in more complex compounds. As it is always present in the soil and in the ordinary fertilizers, there is always an abundance of it for the immediate use of the crop. Therefore, when it is applied in the form of lime it is regarded as an indirect fertilizer which is added to correct acidity of the soil or to improve its mechanical condition.

The other ash constituents are not regarded as important from the agricultural standpoint, as they are not necessary in fertilizers.

The ingredients liable to be deficient in the soil are nitrogen, potash and phosphoric acid, and substances containing one or all of them are used as fertilizers. When the fertilizer contains all of them it is said to be a "complete" fertilizer.

FERTILIZING MATERIALS.

(For Average Analysis see tables pages 4-7.)

(1.) Nitrogen is used in fertilizers in three forms: (a) as Nitrates; (b) as an Ammonium salt, generally sulfate of ammonia and (c) Organic Nitrogen; that is, the nitrogen contained in animal or vegetable matter.

(a.) *Nitrate of Potash* is a powerful fertilizer, being rich in potash as well as in nitrogen. It is not much used as a fertilizer on account of its high cost. *Nitrate of Soda* or "Chili Saltpeter" is imported from Chili and Peru. It is imported in plain bags containing about 300 pounds each, but rarely reaches the farmers in the original bags.

As a fertilizer it is immediately available and being perfectly soluble it is easily washed out of the soil, so that it should not be applied before it is needed. It is not desirable to apply it in the fall for this reason.

(b.) *Ammonia* is a by-product of the gas works and coke ovens, where coal is heated in closed retorts for the purpose of driving off the gas contained in it. The gas contains some ammonia and is passed over water to absorb the ammonia; with sulfuric acid this forms the sulfate of ammonia. It is very soluble; is an excellent fertilizer, but is not so much used as other forms of nitrogen on account of its scarcity and high price.

(c.) *Dried Blood* is obtained from slaughtered animals and is prepared by being dried and ground.

Tankage is the dried residue from the rendering tanks at slaughter houses.

Dried Fish, Fish Scrap, etc., is the dried waste from fish oil factories, canneries, etc.

Cotton Seed Meal and *Linseed Meal* are the ground residues after the oil is pressed out of the cotton seed and flax seed. In this locality they are too valuable as feeds for stock to be used as fertilizers.

Castor Pomace is the residue from castor beans after the oil is pressed out.

Hair, Leather and *Wool Waste* are sometimes used. They are rich in nitrogen but it is not readily available, so they are not regarded favorably as fertilizers.

It is a common practice to state the amount of nitrogen in fertilizers as its equivalent in ammonia. This nitrogen may be readily converted into ammonia by taking up hydrogen. Fourteen parts of nitrogen take up three parts of hydrogen, forming 17 parts of ammonia.

Therefore, multiply nitrogen by seventeen-fourteenths to get ammonia and multiply ammonia by fourteen-seventeenths to get nitrogen.

(2.) Potash compounds are for the most part, imported from Germany where vast deposits of potash salts are found. They are controlled by a syndicate and are sold by the long ton of 2240 lbs.

The three following came in bags of 224 lbs. each, and bear uniform seals:

Muriate of Potash, containing a minimum of 80 per cent. of muriate of potash, equal to 54 per cent. of potash. The bags as imported are marked with any two letters of the alphabet, as A B, B C, D Y, etc.

Sulfate of Potash, containing a minimum of 90 per cent. sulfate of potash, equal to 48.6 per cent. of potash. This is also called "high grade sulfate of potash." The bags, as imported, are marked S P, with a number underneath which refers to the shipment.

Double Manure Salt (also called Sulfate of Potash—Magnesia and low grade Sulfate of Potash) containing a minimum of 48 per cent. of sulfate of potash, equal to nearly 26 per cent. of potash. The bags, as imported, are marked with a square placed diagonally, with a number in the centre which refers to the shipment.

The prices of the syndicate as quoted for the above are for the minimum analysis and when they overrun the buyer must pay for the excess.

The following come in bulk: Kainit, guaranteed 12.4 per cent. potash; Sylvinit, guaranteed 14.5 per cent. potash; Manure Salt, guaranteed 20 per cent. potash.

Kainit is the one that usually reaches the farmer; besides the potash, it contains common salt, sulfate of magnesia, chloride of magnesia and water.

The color of these various potash compounds varies considerably and is no indication of the purity.

Wood ashes are imported in limited amounts from Canada. They furnish potash in the form of carbonate of potash, which is highly available. The amount of potash in ashes, however, is quite variable.

3. Phosphoric Acid is generally derived from the phosphate rocks of South Carolina, Florida or Tennessee. After being taken from the earth the rock is washed to free it from dirt, clay, etc. dried ground to powder and "dissolved" by being treated with sulfuric acid. The acid combines with about two-thirds of the lime forming sulfate of lime or "plaster," which now constitutes about half of the mixture. The mass becomes hard on standing and after a few days or weeks is crushed, sifted, and is ready for market or for mixing with other fertilizing materials.

The dissolved rock is sold under various names as "Dissolved S. C. Rock," "Dissolved Phosphate," "S. C. Rock," "Superphosphate," "Soluble Superphosphate," "Dissolved Bone Phosphate," "Dissolved S. C. Bone," etc., etc. Some farmers who will not buy it when it is called "Rock" will do so when it is called "Bone." Some want it to have a dark color and the manufacturer accommodates them by dumping in a little coal.

The usual guarantee on dissolved rock is 14 per cent. available phosphoric acid, but it is now made to run as high as 18 per cent. available phosphoric acid. This high grade rock is generally used for mixing, as the farmers are not willing to pay an extra price for this grade.

Bone Ash results from simply burning bones. The nitrogen is all lost in the process. The residue is calcium phosphate or "bone phosphate"; it is insoluble and should be dissolved before being used as a fertilizer.

Bone Black is made by charring bones. It is used for refining sugar and after becoming worthless for that purpose is dissolved and used as a fertilizer under the name of "dissolved bone black," the charcoal present giving the product a dark color. It contains no nitrogen and the available phosphoric acid from this source is no better than that from rock phosphate.

BONE MEAL, GROUND BONE, BONE FLOUR, ETC.

Raw bones contain considerable fat which makes them hard to grind and is objectionable. The fat is frequently partially removed by extracting it with benzine or by steaming. In the latter process more or less of the nitrogen is lost. Its value as a fertilizer depends to a great extent on the fineness. It is not so quickly available as soluble phosphoric acid, but decomposes in the soil much quicker than an undissolved rock phosphate. Ground bone is often treated with acid to render it soluble, the product containing nitrogen as well as available phosphoric acid.

Thomas Slag, Slag Meal, etc., is a by-product in the manufacture of steel from ores rich in phosphoric acid. It is extensively used in Europe, but has not been much used in this country; one reason for this being that it has been sold at too high a price to justify its use.

Guano formerly meant a natural fertilizer, resulting from the accumulation of the excrement and remains of sea fowls in rainless

regions, mainly off the coast of Peru. Such deposits are rich in ammonia, potash and phosphoric acid.

The term is also applied to phosphatic deposits from the West Indies, which contain only phosphoric acid and that in an insoluble form.

THE ARITHMETIC OF FERTILIZERS.

In mixing two or more of the above materials to make "complete" fertilizers there are two problems which are liable to present themselves that admit of easy solution. First, given the formula and the analysis of the ingredients to calculate the analysis of the mixture, and Second, given the analysis of the mixture to calculate the formula.

For the first case two rules may be given: (1) Multiply the analysis of each ingredient by the fraction that the ingredient forms of the mixture. Suppose a mixture of 1200 lbs. of Dis. S. C. Rock (containing 14 per cent. available phosphoric acid) and 800 lbs. kainit (containing 12 per cent. potash), making a ton of the mixture. Twelve hundred two-thousandths or three-fifths of the mixture is rock and eight hundred two-thousandths or two-fifths is kainit. Three-fifths of 14 per cent. is 8.4 per cent and two-fifths of 12 per cent. is 4.8 per cent; the mixture should contain 8.4 per cent. available phosphoric acid and 4.8 per cent. potash.

(2.) Multiply the number of pounds of the ingredient in a ton by the analysis of the ingredient expressed as a decimal fraction (this will give the number of pounds of the fertilizing element per ton) and divide the result by 20. Applying this to the example just given we get the following: 1200 multiplied by .14 equals 168.00; 168 divided by 20 equals 8.4 per cent. phosphoric acid; 800 multiplied by .12 equals 96.00; 96 divided by 20 equals 4.8 per cent. potash.

The second problem, calculating a formula when the analysis is given, is not quite so easy as the first, because when one has calculated the proper amount of the ingredients to use for a ton he may find that he has more or less than a ton. If it is more than a ton more concentrated material must be used and a recalculation made; if less than a ton one can make up the deficiency with a "filler" or may select a less concentrated material. For the farmer who is mixing for his own use, however, the "filling" need not be added as the ingredients are in the desired ratio without it. The analysis of the mixture will be higher and less will be required for an acre.

To find the amount of any ingredient required to furnish a given per cent. of phosphoric acid, potash or ammonia, that ingredient should form such a part of the mixture as the required per cent. is of the per cent. in the unmixed ingredient. For example, if one is mixing a ton of fertilizer and wishes to use an amount of kainit (containing 12 per cent. of potash) that will give 3 per cent. of potash in the mixture, one should make the mixture three-twelfths of one-fourth kainit, three the required per cent., being one-fourth of twelve; the latter being the per cent. of potash in the kainit.

HOME MIXING OF FERTILIZERS.

The manufacture of fertilizers cannot be done profitably or properly on a small scale. The grinding requires expensive machinery and the acid required to dissolve the phosphate costs much more if gotten in glass bottles than it does in the fertilizer. It is easier for the manufacturer to pour the acid on the rock than to put it in bottles (carboys). In the factory the acid is made where wanted and is not handled by hand.

It is, however, comparatively easy to mix materials, such as dissolved rock, ground tankage, ground fish, dissolved bone, dried blood, kainit, muriate of potash, etc., on the farm. A pair of scales is desirable but may be dispensed with as the materials come in bags of definite weight or may be purchased in the desired amount. They are mixed by pouring one of the ingredients upon a floor and spreading it out in a uniform layer, the other ingredients are added in uniform layers on top of the first. The pile is then shoveled over several times to mix it thoroughly and finally put through a sand screen such as masons and plasterers use.

Whether it would be profitable to mix the fertilizer needed at home, or buy it ready mixed, will depend largely on the difference in price between the ready mixed and the same amount of plant food unmixed, and is to be determined by each one for himself after getting estimates on each.

THE APPLICATION OF FERTILIZERS—SOIL ANALYSIS.

It is commonly believed that a chemical analysis of the soil will show in what elements it is deficient and in that way show what should be added in order to produce a good crop. This is a mistake. The analysis may be made, and will generally show sufficient plant food for many crops. But the fact is that it is not the total plant food, but only that which is immediately available that produces the crop and there is no satisfactory method to separate the available plant food from the soil, and even if it could be separated the amount required by the crop is such a small fraction of the whole that it could scarcely be detected by the chemical balance. The soil to the depth of one foot on an acre weighs about 6,000,000 pounds. 20 lbs. of phosphoric acid per acre is frequently enough for a good crop. This is one part in 300,000 or only three one-thousandths of one per cent.

This matter is well illustrated by the following analyses from Bailey's "Principles of Agriculture," page 42.

	Water.	Phos. Acid.	Potash.	Nitrogen	Lime.
1. Unproductive Clay...	13.25	0.20	1.10	0.08	0.41
2. Good Bean Land....	15.95	.17	0.75	0.11	0.61

No. 1 was a clay subsoil, from which the soil had been removed, and was so poor that it would not grow beans, still it contained more plant food than the good bean land.

THE ANALYSIS OF PLANTS—(See Pages 8-12.)

By an analysis of plants we learn the amount of fertility that is removed from the soil by crops and the amount that would have to be restored to make good this loss. Usually it is found that the elements of fertility are not all deficient, or are deficient in different degrees, and it is not necessary to restore all that is lost by the crop. Thus, while the ordinary crops consume more potash and nitrogen than phosphoric acid, yet it is generally found more profitable to supply an excess of phosphoric acid. Not only are potash and nitrogen less likely to be deficient in most soils, but the phosphate assists in liberating potash from insoluble combinations in the soil.

From the nature of the case the application of fertilizers can never be reduced to an exact science. In many cases farmers could with profit make some experiments in determining the needs of their land. Five or six plats of equal size could be laid off in the field that is about to be sowed. One plot should be left without fertilizer, one should be fertilized with phosphoric acid, another with potash, another with nitrogen, another with phosphoric acid and potash and another with phosphoric acid and nitrogen. The growth should be observed, and the crop should be weighed after being harvested. From the results one could readily determine whether one or all of the essential fertilizing elements were required. Plots 33 feet square—one fortieth of an acre—make a convenient size.

Lasting qualities are not usually desired in fertilizers. We want quick returns. It is the unavailable fertilizer that lasts the longest. Undissolved rock phosphate, leather and hair last well, because unavailable. At the other extreme is nitrate of soda, which is so soluble that much of it may be lost unless soon taken up by the plants.

Sour soils are not made so by the application of fertilizers, as some suppose, but by natural agencies, as the decay of organic matter and the growth of plants. It is true that there is some acid applied in acid phosphate and fertilizers containing it, but the amount is comparatively small and is easily neutralized by the application of a bushel or two of lime or wood ashes to the acre. We are not saying that when lime is needed that this amount is sufficient, but that it is sufficient to neutralize all of the acid due to a liberal application of fertilizer.

PRICES OF FERTILIZERS.

Prices this season will be higher than last. Below are reprinted some of the current quotations. Nos. 1 to 14 are from the Baltimore "Sun" of February 22, Nos. 15 to 24 are from the "Paint, Oil and Drug Reporter" (New York) of February 19. The column on the right has been added by the editor, and shows the price per pound of the ingredients mentioned, in cents.

PRICES OF FERTILIZERS.

59

1. Kainit, per ton of 2,000 lbs.....	\$10@10.50	Potash, 4 1-6-4 ³
2. Azotin, per unit of Ammonia....	1.90	Ammon., 9 ¹
3. Blood " " " "	2.25	Ammon., 11.15
4. Tankage, 7 per cent. of Ammonia and 30 per cent. Bone, per ton of 2,000 lbs.....	21.00	
5. Tankage, 7 per cent. of Ammonia and 30 per cent. Bone, per ton of 2,000 lbs., ground.....	22.00	
6. Tankage, 9 per cent of Ammonia and 20 per cent. Bone, unground	25.00	
7. Tankage, 9 per cent. of Ammonia and 20 per cent. Bone, ground..	26.00	
8. Nitrate of Soda, cargo lots, per 100 lbs.....	1.80	Ammon., 9 ¹
9. Nitrate of Soda, job lots, per 100 lbs.....	2.25	Ammon., 12
10. Sulphate of Ammonia, per 100 lbs	3.10	Ammon., 12 2-5
11. Ground Bone, per ton of 2,000 lbs.....	\$26.00@28.00	
12. Dissolved S. C. Phosphate Rock, per ton, in bags.....	10.00	Av. P. Ac., 4 1-6
13. Dried Fish Scrap, unground, per ton.....	23.00	
14. Dried Fish Scrap, ground, per ton.....	25.00	
15. Potash, Double Manure Salt, 48@53 per cent., less than 25 tons.....	26.00@33.00	Pot., 5
16. Potash, Sulfate, basis of 90@ 98 per cent, less than 25 tons.....	40.00@42.00	Pot., 3-7-4
17. Potash Kainit, 25 per cent. S. of P., less than 25 tons.....	10.00@14.00	Pot., 3-7-5 1-6
18. Potash, Muriate, less than 25 tons.....	38.00@42.00	Pot., 3-4-3 ¹
19. Ammonia, Sulfate.....	3.00@ 3.05	Ammo., 12-12 1-5
20. Blood, dried, red, per unit....	2.50@ 2.60	Ammon., 12 ¹ -13
21. Phosphate Rock, f. o. b. Charleston.....	3.50@ 4.00	
22. Phosphate Rock, f. o. b., Peace River.....	4.00@ 4.50	
23. Phosphate Rock, Land Peb- ble, 70 per cent.....	3.00@ 3.25	
24. Acid Phosphate.....	.60@ .62	Av. P. Ac., 3-3.1.

Some explanation is necessary in regard to these prices.

In Nos. 2, 3 and 20 the price quoted is per "unit" of ammonia; it is the price to be paid for each per cent. of ammonia present in the ton. To get the price per ton multiply the price per unit by the analysis.

In Nos. 8, 9, 10 and 19 the price is per 100 lbs.

In Nos. 4 to 7 the percentage of "bone," as well as of ammonia is guaranteed. The "bone" is the "bone phosphate of lime," which is 2 1-5 times the phosphoric acid.

In Nos. 15 to 18 the prices are per long ton of 2,240 lbs.

In Nos. 21, 22 and 23 the prices are "f. o. b.," i. e., the material or freight is delivered on board vessels at the place named, the freight from that point to be paid by the buyer. These prices are for the rock in its natural condition after being washed to free it from clay, etc., and dried.

No. 21 is S. C. Rock and Nos. 22 and 23 are Florida rocks. In No. 23 the guarantee of "bone phosphate" is given.

In No. 24 the price is per unit of available phosphoric acid in bulk.

SUPPLEMENTARY LIST OF FERTILIZERS LICENSED FOR
SALE IN MARYLAND, FOR THE YEAR ENDING
FEBRUARY 1st, 1900.

ARMOUR FERTILIZER WORKS, CHICAGO, ILL.

All Soluble.
Grain Grower.

BALTIMORE PULVERIZING CO., BALTIMORE, MD.

Special Mixture.

BAUGH & SONS CO., BALTIMORE, MD.

Corn Fertilizer.
Lobos Peruvian Guano.
Peninsula Grain Producer.
Raw Bone Phosphate.
Soluble Alkaline.

A. D. BIRELY & SON, LADIESBURG, MD.

Ammoniated Bone Phosphate.
Dissolved Bones.

CHEMICAL CO. OF CANTON, BALTIMORE, MD.

Harrow Brand Crop Grower.

E. FRANK COE, NEW YORK.

Western New Yorker.

RUFUS K. DAY, BROWNSVILLE, MD.

Day's Ammoniated Bone Phosphate.

DETRICK FERTILIZER AND CHEMICAL CO., BALTIMORE,
MARYLAND.

Price's Bone and Potash.

G. H. GILL, AVALON, VA.

Try Me Fertilizer.

GRIFFITH & BOYD, BALTIMORE, MD.

Harvest Queen Phosphate.

HUBBARD & CO., BALTIMORE, MD.

Day's Ammoniated Bone Phosphate.

LISTER'S AGRICULTURAL CHEMICAL WORKS, NEWARK,
NEW JERSEY.

Special Fertilizer for Wheat.

WILLIAM MCKENNEY, CENTREVILLE, MD.

McKenney's Soluble No. 3 Phosphate.
No. 1 D Wheat Fertilizer.
Compound.

MARYLAND GRANGE AGENCY, BALTIMORE, MD.

Agency's Favorite.

MILLER FERTILIZER COMPANY, BALTIMORE, MD.

Hustler Phosphate.
Special Wheat Grower.

- NICKERSON FERTILIZER CO., EASTON, MD.
Mixture.
- PIEDMONT-MT. AIRY GUANO CO., BALTIMORE, MD.
Levering's Reliable.
Piedmont Soluble Bone and Potash.
- RASIN-MONUMENTAL CO., BALTIMORE, MD.
Monocacy Special.
- RAMSBURG FERTILIZER CO., FREDERICK, MD.
Excelsior Half and Half.
- REINDOLLAR & CO., TANEYTOWN, MD.
Acidulated Bone Phosphate.
Fish Phosphate.
- ISAAC ROBINSON, BALTIMORE, MD.
Special Wheat and Grass Phosphate.
- SOUTHERN FERTILIZER CO., YORK, PA.
Royal Wheat and Grass.
- J. W. STONEBRAKER & SON, HAGERSTOWN, MD.
Bone Meal.
Dissolved Animal Bone.
Dissolved Bone Phosphate.
South Carolina.
Special.
- J. W. SULLIVAN, MONROVIA, MD.
Bone and Potash Mixture.
- SUSQUEHANNA FERTILIZER CO., BALTIMORE, MD.
Cereal Guano.
Grain and Grass Producer.
H. G. Bone and Potash.
- THE ZELL GUANO CO., BALTIMORE, MD.
Dissolved S. C. Phosphate.

Fertilizer Law of Maryland.

CHAPTER 397.

AN ACT to repeal sections one, two, three, four, five, six, seven, eight, nine, ten and eleven, of Article sixty-one, of Public General Laws, entitled "Manures and Fertilizers," as amended and re-enacted by Chapter three hundred and eighty-seven, Acts of 1890, and to re-enact the same with amendments.

SECTION 1. Be it enacted by the General Assembly of Maryland, That sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11, of Article 61, of the Code of Public General Laws, as amended and re-enacted by Chapter 387, of Acts of 1890, be and the same are hereby repealed and re-enacted to read as follows:

SECTION 1. That the term fertilizer, as used in this Act, shall be held to mean any commercial fertilizer, or any article, substance or mixture sold, offered or exposed for sale for manurial purposes within this State, of which the selling price shall be more than ten dollars per ton of two thousand pounds.

That the term brand, as used in this Act, shall be held to mean the name under which the commercial fertilizer is sold, together with the statement of the percentage of valuable ingredients contained therein.

That the professor in charge of the Chemical Department of the Maryland Agricultural College shall be *ex-officio* State Chemist, or (that the term State Chemist, as used in this act, shall mean the professor in charge of the Chemical Department of the Maryland Agricultural College.)

SEC. 2. And be it enacted, That before any fertilizer is sold, offered or exposed for sale within the State, the following conditions must be complied with: (1) The importer, manufacturer, manipulator, dealer or agent shall take out a license for the sale of fertilizer, which license shall be rated upon the number of brands contemplated to be sold at the rate of fifteen dollars for each brand; said license to be prepared and furnished by the Comptroller of the Treasury, and to be issued at any time, to be good until the first day of February following; provided, that when any such importer, manufacturer or manipulator shall have taken out a license as herein provided, it shall not be necessary for any other person, as his agent or representative, to take out a license to sell the fertilizers provided for by the party who has taken out such license. (2) Every bag, barrel or package of fertilizer, and every

parcel or lot, if sold in bulk, must bear in legible print, or be accompanied by a clear and true statement showing the net pounds of fertilizer in the package or lot, the name, brand or trade-mark under which the fertilizer is sold, the name and address of the importer, manufacturer or manipulator, the place of manufacture or manipulation, and a chemical analysis stating the per centum of the minimum, and only the minimum, contained therein of nitrogen or its equivalent in available ammonia, of potash soluble in distilled water, and of available phosphoric acid.

SEC. 3. And be it enacted, That any failure to comply with any or all of the conditions provided in section two of this Act, shall be punishable by a fine of one hundred dollars (\$100) for the first offence, and of two hundred dollars (\$200) for every subsequent offence.

SEC. 4. And be it enacted, That any person, firm or company selling or offering for sale any fertilizer in this State, or intending so to do, and not licensed by the Comptroller as provided by this Act, shall on and before the thirty-first day of July in each and every year, send his or their name or names with the postoffice address and the names of the kinds, brands and trade-marks, and of the manufacturer, importer or manipulator of each fertilizer sold or proposed to be sold to the Maryland Agricultural College, and the same shall be registered in suitable books kept for that purpose, and any failure to comply with the provisions of this section, shall be punishable by a fine of twenty-five dollars (\$25) for the first offense and of fifty dollars (\$50) for every subsequent offense.

SEC. 5. And be it enacted, That it shall be duty of the Maryland Agricultural College to analyze without cost or charge, all samples of fertilizer sent to it for the purpose of being analyzed by any person or persons purchasing or procuring the same in this State for his or their use or uses; provided, such persons are not interested in the analysis desired other than a consumer, of which affidavit shall be made and shall accompany each sample or brand; and further, such samples are taken and sent as described by this Act and free of cost of transportation to said college, and it shall be the duty of the Maryland Agricultural College to procure samples as far as practicable in every year, of all the fertilizers sold and used in this State, for the purpose of analyzing the same, and any duly authorized agent or representative of the said college shall have the right to take samples as provided by the Act from any lot or parcel of fertilizer in transit or in possession or keeping of any manufacturer, manipulator, dealer or agent, and sold or offered for sale in this State, and it shall be the duty of the Maryland Agricultural College to send in the result of every sample of fertilizer to the persons from whom such sample was taken or received, and also to publish from time to time the results of the analysis made by the said college of the samples sent to or procured by it for such purpose, and it shall be the duty of the Maryland Agricultural College when reporting or publishing the result of any analysis made, to state the commercial value in dollars

and cents of the fertilizer so analyzed, per ton of two thousand pounds, such value to be based upon the analysis made by the college, and upon a standard of valuation to be ascertained, fixed and published by said college, annually, after conference with the proper officials of adjacent States.

SEC. 6. And be it enacted, That all samples of fertilizers for analysis at the Maryland Agricultural College shall be taken from unbroken packages that have not been injured in transit or by exposure, and when in the possession of purchasers within thirty days after coming into their possession, and every such sample when taken by an agent or representative of the college, shall be taken in the presence of the owner, agent or dealer in possession thereof, or of his or their representatives, and when by an owner or consumer, it shall be taken in the presence of one disinterested witness; and every sample shall be taken from a bag or package or a number of bags or packages, which shall not be less than five per cent. of the whole lot to which the sampling pertains; and in every case not over two pounds shall be taken from near the top, the bottom and the middle of the bag or packages sampled, and these portions shall be thoroughly mixed in a clean dry place, and a suitable sample shall be taken from said mixture and placed in a suitable vessel or vessels carefully closed with identifying labels, both within and without the vessel or vessels, and the same then taken or sent by safe carriage to the said college for analysis; and there shall accompany every such sample a full and complete statement and description of the place and time of sampling, of the lot of fertilizer sampled, of all marks on the bags or packages thereof, and other facts relating to the same, and such statement and description shall be signed by the person who does the sampling and by the witness thereto.

SEC. 7. And be it enacted, That the funds received by the Comptroller from the licenses issued under this Act shall be paid into the Treasury and be set apart as a specific fund to pay the cost and expenses of conducting the analysis provided for in section five of this Act, and the Treasurer shall semi-annually pay over to the Maryland Agricultural College the money received from said licenses; provided, that the amount paid in any one year shall not be more than at the rate of fifteen dollars (\$15) for each sample of fertilizer analyzed by the said College.

Sec. 8. And be it enacted, That any purchaser of fertilizer who shall be injured or defrauded by the contents of the bag, barrel or other packages, not conforming in quantity or quality to the marks, labels or statements on or accompanying the same, may recover from the seller or sellers thereof, in an action of debt, an amount equal to the purchase money of said fertilizer and the cost of suit; and in case the purchase is made of an agent of any person or persons residing out of the limits of the State of Maryland, or company or corporation whose principal place of business is out of the State, manufacturing, compounding, preparing

and furnishing for sale any such commerical fertilizer, the purchaser thereof may, at his or her option, proceed by attachment, as now provided for by law in cases of non-resident and absconding debtors, against any property, rights or credit of any person, persons, company or corporation selling, manufacturing, preparing, compounding or furnishing said fertilizer when such property, rights or credits can be found within the limits of the State of Maryland.

SEC. 9. And be it enacted, That any manufacturer, dealer, agent or other person or persons who shall adulterate, add to or to take anything from any fertilizer, sold or offered for sale within this State, or who shall use the brand or trade mark of any manufacturer or dealer other than his own, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof in any Court having jurisdiction, be punished by a fine not exceeding two hundred dollars (\$200) and imprisonment in jail not exceeding six months, or by fine and imprisonment at the discretion of the Court before whom he shall be tried.

SEC. 10. And be it enacted, That this Act shall not affect parties importing, manufacturing or manipulating fertilizer for their own use if not sold or disposed of; and it shall not apply to substances and materials sold in bulk to manufacturers or manipulators of fertilizer, and nothing in this Act shall prevent the buyer and seller from making contracts in reference to the price to be paid dependent upon the composition or quality of the fertilizer contracted for, but no arrangement or agreement, verbal or written, made by or between any seller and buyer of fertilizer in this State, for the purpose of exonerating the seller or manufacturer from liability for any violation of any of the provisions of this Act shall exempt any person from such liability.

SEC. 11. And be it enacted, That it shall be the duty of all State's Attorneys to prosecute all persons accused of violating this Act, or any of the provisions of this Act, or of the Act to which this is a supplement.

SEC. 12. And be it enacted, That this Act shall take effect on the first day of May, in the year eighteen hundred and ninety-four.

Approved April 6th, 1894.

FRANK BROWN,

Governor.

JAS. H. PRESTON,

Speaker of the House of Delegates.

JOHN WALTER SMITH,

President of the Senate.



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R. W. SILVESTER,

President Maryland Agricultural College,

College Park, Md.

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